Mathematica 11.3 Integration Test Results

Test results for the 336 problems in "6.2.5 Hyperbolic cosine functions.m"

Problem 1: Result more than twice size of optimal antiderivative.

$$\int \text{Cosh}[a + b\,x]\, dx$$

Optimal (type 3, 10 leaves, 1 step):

$$\frac{\text{Sinh}[a + b\,x]}{b}$$

Result (type 3, 21 leaves):

$$\frac{\text{Cosh}[b\,x]\,\text{Sinh}[a]}{b} + \frac{\text{Cosh}[a]\,\text{Sinh}[b\,x]}{b}$$

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

$$\int \frac{1}{5 + 3\,\text{Cosh}[c + d\,x]}\, dx$$

Optimal (type 3, 31 leaves, 1 step):

$$\frac{x}{4} - \frac{\text{ArcTanh}\left[\frac{\text{Sinh}[c+d\,x]}{3+\text{Cosh}[c+d\,x]}\right]}{2\,d}$$

Result (type 3, 65 leaves):

$$-\frac{\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}\,(c + d\,x)\right] - \text{Sinh}\left[\frac{1}{2}\,(c + d\,x)\right]\right]}{4\,d} + \frac{\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}\,(c + d\,x)\right] + \text{Sinh}\left[\frac{1}{2}\,(c + d\,x)\right]\right]}{4\,d}$$

Problem 76: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(5 + 3\,\text{Cosh}[c + d\,x])^2}\, dx$$

Optimal (type 3, 56 leaves, 3 steps):

$$\frac{5\,x}{64} - \frac{5\,\text{ArcTanh}\left[\frac{\text{Sinh}[c+d\,x]}{3+\text{Cosh}[c+d\,x]}\right]}{32\,d} - \frac{3\,\text{Sinh}[c + d\,x]}{16\,d\,(5 + 3\,\text{Cosh}[c + d\,x])}$$

Result (type 3, 144 leaves):

$$\left(-15\,\text{Cosh}[c+d\,x]\left(\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]-\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)+25\left(-\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]+\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)-12\,\text{Sinh}[c+d\,x]\right)\Big/\left(64\,d\,(5+3\,\text{Cosh}[c+d\,x])\right)$$

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

$$\int \frac{1}{(5+3\,\text{Cosh}[c+d\,x])^3}\,dx$$

Optimal (type 3, 81 leaves, 4 steps):

$$\frac{59\,x}{2048}-\frac{59\,\text{ArcTanh}\left[\frac{\text{Sinh}[c+d\,x]}{3+\text{Cosh}[c+d\,x]}\right]}{1024\,d}-\frac{3\,\text{Sinh}[c+d\,x]}{32\,d\,(5+3\,\text{Cosh}[c+d\,x])^2}-\frac{45\,\text{Sinh}[c+d\,x]}{512\,d\,(5+3\,\text{Cosh}[c+d\,x])}$$

Result (type 3, 217 leaves):

$$-\frac{59\,\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]}{2048\,d}+\frac{59\,\text{Log}\left[2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right]}{2048\,d}-\frac{3}{512\,d\left(2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\frac{45\,\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]}{2048\,d\left(2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right)}+\frac{3}{512\,d\left(2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\frac{45\,\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]}{2048\,d\left(2\,\text{Cosh}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sinh}\left[\frac{1}{2}(c+d\,x)\right]\right)}$$

Problem 78: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(5+3\,\text{Cosh}[c+d\,x])^4}\,dx$$

Optimal (type 3, 106 leaves, 5 steps):

$$\frac{385\,x}{32768}-\frac{385\,\text{ArcTanh}\left[\frac{\text{Sinh}[c+d\,x]}{3+\text{Cosh}[c+d\,x]}\right]}{16384\,d}-\frac{\text{Sinh}[c+d\,x]}{16\,d\,(5+3\,\text{Cosh}[c+d\,x])^3}-\frac{25\,\text{Sinh}[c+d\,x]}{512\,d\,(5+3\,\text{Cosh}[c+d\,x])^2}-\frac{311\,\text{Sinh}[c+d\,x]}{8192\,d\,(5+3\,\text{Cosh}[c+d\,x])}$$

Result (type 3, 296 leaves):

$$-\frac{1}{131072\, d\, (5+3\, \text{Cosh}[c+d\, x])^3}\Bigg(296450\, \text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]-\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]+$$
$$10395\, \text{Cosh}[3\, (c+d\, x)]\, \text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]-\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]+$$
$$377685\, \text{Cosh}[c+d\, x]\, \Big(\text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]-\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]-$$
$$\text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]+\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]\Big)+$$
$$103950\, \text{Cosh}[2\, (c+d\, x)]\, \Big(\text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]-\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]-$$
$$\text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]+\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]\Big)-$$
$$296450\, \text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]+\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]-$$
$$10395\, \text{Cosh}[3\, (c+d\, x)]\, \text{Log}\Big[2\, \text{Cosh}\Big[\frac{1}{2}\, (c+d\, x)\Big]+\text{Sinh}\Big[\frac{1}{2}\, (c+d\, x)\Big]\Big]+$$
$$175788\, \text{Sinh}[c+d\, x]+84240\, \text{Sinh}[2\, (c+d\, x)]+11196\, \text{Sinh}[3\, (c+d\, x)]\Bigg)$$

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

$$\int \sqrt{a+b\, \text{Cosh}[x]}\, \text{Tanh}[x]\, dx$$

Optimal (type 3, 37 leaves, 4 steps):

$$-2\, \sqrt{a}\, \text{ArcTanh}\Big[\frac{\sqrt{a+b\, \text{Cosh}[x]}}{\sqrt{a}}\Big]+2\, \sqrt{a+b\, \text{Cosh}[x]}$$

Result (type 3, 75 leaves):

$$\frac{1}{b+a\, \text{Sech}[x]}2\, \sqrt{a+b\, \text{Cosh}[x]}\, \left(b+a\, \text{Sech}[x]-\sqrt{a}\, \sqrt{b}\, \text{ArcSinh}\Big[\frac{\sqrt{a}\, \sqrt{\text{Sech}[x]}}{\sqrt{b}}\Big]\, \sqrt{\text{Sech}[x]}\, \sqrt{1+\frac{a\, \text{Sech}[x]}{b}}\right)$$

Problem 198: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Tanh}[x]}{\sqrt{a+b\, \text{Cosh}[x]}}\, dx$$

Optimal (type 3, 24 leaves, 3 steps):

$$-\frac{2\, \text{ArcTanh}\Big[\frac{\sqrt{a+b\, \text{Cosh}[x]}}{\sqrt{a}}\Big]}{\sqrt{a}}$$

Result (type 3, 60 leaves):

$$-\frac{2\sqrt{b}\,\text{ArcSinh}\left[\frac{\sqrt{a}\,\sqrt{\text{Sech}[x]}}{\sqrt{b}}\right]\sqrt{\frac{b+a\,\text{Sech}[x]}{b}}}{\sqrt{a}\,\sqrt{a+b\,\text{Cosh}[x]}\,\sqrt{\text{Sech}[x]}}$$

Problem 210: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{x}{a+b\,\text{Cosh}[x]^2}\,dx$$

Optimal (type 4, 191 leaves, 9 steps):

$$\frac{x\,\text{Log}\left[1+\frac{b\,e^{2x}}{2a+b-2\sqrt{a}\,\sqrt{a+b}}\right]}{2\sqrt{a}\,\sqrt{a+b}}-\frac{x\,\text{Log}\left[1+\frac{b\,e^{2x}}{2a+b+2\sqrt{a}\,\sqrt{a+b}}\right]}{2\sqrt{a}\,\sqrt{a+b}}+\frac{\text{PolyLog}\left[2,-\frac{b\,e^{2x}}{2a+b-2\sqrt{a}\,\sqrt{a+b}}\right]}{4\sqrt{a}\,\sqrt{a+b}}-\frac{\text{PolyLog}\left[2,-\frac{b\,e^{2x}}{2a+b+2\sqrt{a}\,\sqrt{a+b}}\right]}{4\sqrt{a}\,\sqrt{a+b}}$$

Result (type 4, 536 leaves):

$$-\frac{1}{4\sqrt{-a(a+b)}}\left(4\,x\,\text{ArcTan}\left[\frac{(a+b)\,\text{Coth}[x]}{\sqrt{-a(a+b)}}\right]+2\,i\,\text{ArcCos}\left[-1-\frac{2a}{b}\right]\text{ArcTan}\left[\frac{a\,\text{Tanh}[x]}{\sqrt{-a(a+b)}}\right]+\right.$$

$$\left(\text{ArcCos}\left[-1-\frac{2a}{b}\right]+2\,\text{ArcTan}\left[\frac{(a+b)\,\text{Coth}[x]}{\sqrt{-a(a+b)}}\right]-2\,\text{ArcTan}\left[\frac{a\,\text{Tanh}[x]}{\sqrt{-a(a+b)}}\right]\right)$$

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

$$\left(\text{ArcCos}\left[-1-\frac{2a}{b}\right]-2\,\text{ArcTan}\left[\frac{(a+b)\,\text{Coth}[x]}{\sqrt{-a(a+b)}}\right]+2\,\text{ArcTan}\left[\frac{a\,\text{Tanh}[x]}{\sqrt{-a(a+b)}}\right]\right)$$

$$\text{Log}\left[\frac{\sqrt{2}\,\sqrt{-a(a+b)}\,e^{x}}{\sqrt{b}\,\sqrt{2a+b+b\,\text{Cosh}[2x]}}\right]-\left(\text{ArcCos}\left[-1-\frac{2a}{b}\right]-2\,\text{ArcTan}\left[\frac{a\,\text{Tanh}[x]}{\sqrt{-a(a+b)}}\right]\right)$$

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

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

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

$$i\left(\text{PolyLog}\left[2,\frac{\left(2a+b-2\,i\sqrt{-a(a+b)}\right)\left(a+b-i\sqrt{-a(a+b)}\,\text{Tanh}[x]\right)}{b\left(a+b+i\sqrt{-a(a+b)}\,\text{Tanh}[x]\right)}\right]-\right.$$

$$\left.\left.\text{PolyLog}\left[2,\frac{\left(2a+b+2\,i\sqrt{-a(a+b)}\right)\left(a+b-i\sqrt{-a(a+b)}\,\text{Tanh}[x]\right)}{b\left(a+b+i\sqrt{-a(a+b)}\,\text{Tanh}[x]\right)}\right]\right)\right)$$

Problem 224: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x\,\text{Sinh}[c+d\,x]}{a+b\,\text{Cosh}[c+d\,x]}\,dx$$

Optimal (type 4, 161 leaves, 7 steps):

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

Result (type 4, 279 leaves):

$$\frac{1}{b\,d^2}\left(\frac{1}{2}\left(c+d\,x\right)^2+4\,\mathbb{i}\,\text{ArcSin}\left[\frac{\sqrt{\frac{a+b}{b}}}{\sqrt{2}}\right]\,\text{ArcTanh}\left[\frac{\left(a-b\right)\,\text{Tanh}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]}{\sqrt{a^2-b^2}}\right]+\right.$$

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

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

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

Problem 232: Attempted integration timed out after 120 seconds.

$$\int\frac{\text{Sinh}\left[c+d\,x\right]^2}{x\,\left(a+b\,\text{Cosh}\left[c+d\,x\right]\right)}\,dx$$

Optimal (type 8, 27 leaves, 0 steps):

$$\text{Int}\left[\frac{\text{Sinh}\left[c+d\,x\right]^2}{x\,\left(a+b\,\text{Cosh}\left[c+d\,x\right]\right)},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 236: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{x\,\text{Sinh}\left[c+d\,x\right]^3}{a+b\,\text{Cosh}\left[c+d\,x\right]}\,dx$$

Optimal (type 4, 288 leaves, 13 steps):

$$\frac{x}{4\,b\,d}-\frac{\left(a^2-b^2\right)x^2}{2\,b^3}-\frac{a\,x\,\text{Cosh}[c+d\,x]}{b^2\,d}+\frac{\left(a^2-b^2\right)x\,\text{Log}\left[1+\frac{b\,e^{c+d\,x}}{a-\sqrt{a^2-b^2}}\right]}{b^3\,d}+\frac{\left(a^2-b^2\right)x\,\text{Log}\left[1+\frac{b\,e^{c+d\,x}}{a+\sqrt{a^2-b^2}}\right]}{b^3\,d}+\frac{\left(a^2-b^2\right)\text{PolyLog}\left[2,-\frac{b\,e^{c+d\,x}}{a-\sqrt{a^2-b^2}}\right]}{b^3\,d^2}+\frac{\left(a^2-b^2\right)\text{PolyLog}\left[2,-\frac{b\,e^{c+d\,x}}{a+\sqrt{a^2-b^2}}\right]}{b^3\,d^2}+\frac{a\,\text{Sinh}[c+d\,x]}{b^2\,d^2}-\frac{\text{Cosh}[c+d\,x]\,\text{Sinh}[c+d\,x]}{4\,b\,d^2}+\frac{x\,\text{Sinh}[c+d\,x]^2}{2\,b\,d}$$

Result (type 4, 621 leaves):

$$\frac{1}{8\,b^3\,d^2}\Bigg(-8\,a\,b\,d\,x\,\text{Cosh}[c+d\,x]+2\,b^2\,d\,x\,\text{Cosh}[2\,(c+d\,x)]-8\,a^2\,c\,\text{Log}\left[1+\frac{b\,\text{Cosh}[c+d\,x]}{a}\right]+8\,b^2\,c\,\text{Log}\left[1+\frac{b\,\text{Cosh}[c+d\,x]}{a}\right]+$$

$$8\,a^2\left(\frac{1}{2}(c+d\,x)^2+4\,i\,\text{ArcSin}\left[\frac{\sqrt{\frac{a+b}{b}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{(a-b)\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2-b^2}}\right]+\left(c+d\,x-2\,i\,\text{ArcSin}\left[\frac{\sqrt{\frac{a+b}{b}}}{\sqrt{2}}\right]\right)\text{Log}\left[1+\frac{\left(a-\sqrt{a^2-b^2}\right)e^{-c-d\,x}}{b}\right]+\left(c+d\,x+2\,i\,\text{ArcSin}\left[\frac{\sqrt{\frac{a+b}{b}}}{\sqrt{2}}\right]\right)\text{Log}\left[1+\frac{\left(a+\sqrt{a^2-b^2}\right)e^{-c-d\,x}}{b}\right]-\text{PolyLog}\left[2,\frac{\left(-a+\sqrt{a^2-b^2}\right)e^{-c-d\,x}}{b}\right]-\text{PolyLog}\left[2,-\frac{\left(a+\sqrt{a^2-b^2}\right)e^{-c-d\,x}}{b}\right]\right)-$$

$$8\,b^2\left(\frac{1}{2}(c+d\,x)^2+4\,i\,\text{ArcSin}\left[\frac{\sqrt{\frac{a+b}{b}}}{\sqrt{2}}\right]\text{ArcTanh}\left[\frac{(a-b)\,\text{Tanh}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{a^2-b^2}}\right]+\right.$$

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

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

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

$$\left.8\,a\,b\,\text{Sinh}[c+d\,x]-b^2\,\text{Sinh}\left[2\,(c+d\,x)\right]\right)$$

Problem 238: Attempted integration timed out after 120 seconds.

$$\int\frac{\text{Sinh}[c+d\,x]^3}{x\,(a+b\,\text{Cosh}[c+d\,x])}\,dx$$

Optimal (type 8, 27 leaves, 0 steps):

$$\text{Int}\left[\frac{\text{Sinh}[c+d\,x]^3}{x\,(a+b\,\text{Cosh}[c+d\,x])},x\right]$$

Result (type 1, 1 leaves):

???

Problem 247: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Cosh}[a+b\,\text{Log}[c\,x^n]]}{x}\,dx$$

Optimal (type 3, 18 leaves, 2 steps):

$$\frac{\text{Sinh}[a+b\,\text{Log}[c\,x^n]]}{b\,n}$$

Result (type 3, 37 leaves):

$$\frac{\text{Cosh}[b\,\text{Log}[c\,x^n]]\,\text{Sinh}[a]}{b\,n}+\frac{\text{Cosh}[a]\,\text{Sinh}[b\,\text{Log}[c\,x^n]]}{b\,n}$$

Problem 262: Result more than twice size of optimal antiderivative.

$$\int \text{Cosh}\left[\frac{a+b\,x}{c+d\,x}\right] dx$$

Optimal (type 4, 101 leaves, 5 steps):

$$\frac{(c+d\,x)\,\text{Cosh}\left[\frac{a+b\,x}{c+d\,x}\right]}{d}+\frac{(b\,c-a\,d)\,\text{CoshIntegral}\left[\frac{b\,c-a\,d}{d\,(c+d\,x)}\right]\text{Sinh}\left[\frac{b}{d}\right]}{d^2}-\frac{(b\,c-a\,d)\,\text{Cosh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{b\,c-a\,d}{d\,(c+d\,x)}\right]}{d^2}$$

Result (type 4, 373 leaves):

$$\frac{1}{2\,d^2}\left(2\,c\,d\,\text{Cosh}\left[\frac{a+b\,x}{c+d\,x}\right]+2\,d^2\,x\,\text{Cosh}\left[\frac{a+b\,x}{c+d\,x}\right]+\right.$$
$$(b\,c-a\,d)\,\text{CoshIntegral}\left[\frac{b\,c-a\,d}{c\,d+d^2\,x}\right]\left(-\text{Cosh}\left[\frac{b}{d}\right]+\text{Sinh}\left[\frac{b}{d}\right]\right)+$$
$$(b\,c-a\,d)\,\text{CoshIntegral}\left[\frac{-b\,c+a\,d}{d\,(c+d\,x)}\right]\left(\text{Cosh}\left[\frac{b}{d}\right]+\text{Sinh}\left[\frac{b}{d}\right]\right)+$$
$$b\,c\,\text{Cosh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{-b\,c+a\,d}{d\,(c+d\,x)}\right]-a\,d\,\text{Cosh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{-b\,c+a\,d}{d\,(c+d\,x)}\right]+$$
$$b\,c\,\text{Sinh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{-b\,c+a\,d}{d\,(c+d\,x)}\right]-a\,d\,\text{Sinh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{-b\,c+a\,d}{d\,(c+d\,x)}\right]-$$
$$b\,c\,\text{Cosh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{b\,c-a\,d}{c\,d+d^2\,x}\right]+a\,d\,\text{Cosh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{b\,c-a\,d}{c\,d+d^2\,x}\right]+$$
$$\left.b\,c\,\text{Sinh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{b\,c-a\,d}{c\,d+d^2\,x}\right]-a\,d\,\text{Sinh}\left[\frac{b}{d}\right]\text{SinhIntegral}\left[\frac{b\,c-a\,d}{c\,d+d^2\,x}\right]\right)$$

Problem 275: Result is not expressed in closed-form.

$$\int e^x\,\text{Sech}[2\,x]\,dx$$

Optimal (type 3, 92 leaves, 11 steps):

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

Result (type 7, 31 leaves):

$$-\frac{1}{2}\,\text{RootSum}\left[1+\#1^4\,\&,\,\frac{x-\text{Log}\left[e^x-\#1\right]}{\#1}\,\&\right]$$

Problem 276: Result is not expressed in closed-form.

$$\int e^x\,\text{Sech}[2\,x]^2\,dx$$

Optimal (type 3, 111 leaves, 12 steps):

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

Result (type 7, 46 leaves):

$$-\frac{e^x}{1+e^{4x}}-\frac{1}{4}\text{RootSum}\left[1+\#1^4\ \&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\ \&\right]$$

Problem 279: Result is not expressed in closed-form.

$$\int e^x\ \text{Sech}[3x]\ dx$$

Optimal (type 3, 55 leaves, 9 steps):

$$-\frac{\text{ArcTan}\left[\frac{1-2e^{2x}}{\sqrt{3}}\right]}{\sqrt{3}}-\frac{1}{3}\text{Log}\left[1+e^{2x}\right]+\frac{1}{6}\text{Log}\left[1-e^{2x}+e^{4x}\right]$$

Result (type 7, 55 leaves):

$$\frac{2x}{3}-\frac{1}{3}\text{Log}\left[1+e^{2x}\right]-\frac{1}{3}\text{RootSum}\left[1-\#1^2+\#1^4\ \&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^2}\ \&\right]$$

Problem 280: Result is not expressed in closed-form.

$$\int e^x\ \text{Sech}[3x]^2\ dx$$

Optimal (type 3, 110 leaves, 13 steps):

$$-\frac{2e^x}{3\left(1+e^{6x}\right)}+\frac{2\,\text{ArcTan}\left[e^x\right]}{9}-\frac{1}{9}\text{ArcTan}\left[\sqrt{3}-2e^x\right]+$$
$$\frac{1}{9}\text{ArcTan}\left[\sqrt{3}+2e^x\right]-\frac{\text{Log}\left[1-\sqrt{3}\ e^x+e^{2x}\right]}{6\sqrt{3}}+\frac{\text{Log}\left[1+\sqrt{3}\ e^x+e^{2x}\right]}{6\sqrt{3}}$$

Result (type 7, 90 leaves):

$$\frac{1}{9}\left(-\frac{6e^x}{1+e^{6x}}+2\,\text{ArcTan}\left[e^x\right]+\right.$$
$$\left.\text{RootSum}\left[1-\#1^2+\#1^4\ \&,\ \frac{-2x+2\,\text{Log}\left[e^x-\#1\right]+x\,\#1^2-\text{Log}\left[e^x-\#1\right]\#1^2}{-\#1+2\,\#1^3}\ \&\right]\right)$$

Problem 283: Result is not expressed in closed-form.

$$\int e^x\ \text{Sech}[4x]\ dx$$

Optimal (type 3, 371 leaves, 21 steps):

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

$$\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}}+2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{2\sqrt{2\left(2-\sqrt{2}\right)}}-\frac{\text{Log}\left[1-\sqrt{2-\sqrt{2}}\;e^x+e^{2x}\right]}{4\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\text{Log}\left[1+\sqrt{2-\sqrt{2}}\;e^x+e^{2x}\right]}{4\sqrt{2\left(2-\sqrt{2}\right)}}+$$

$$\frac{\text{Log}\left[1-\sqrt{2+\sqrt{2}}\;e^x+e^{2x}\right]}{4\sqrt{2\left(2+\sqrt{2}\right)}}-\frac{\text{Log}\left[1+\sqrt{2+\sqrt{2}}\;e^x+e^{2x}\right]}{4\sqrt{2\left(2+\sqrt{2}\right)}}$$

Result (type 7, 31 leaves):

$$-\frac{1}{4}\,\text{RootSum}\left[1+\#1^8\,\&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^3}\,\&\right]$$

Problem 284: Result is not expressed in closed-form.

$$\int e^x\,\text{Sech}[4\,x]^2\,dx$$

Optimal (type 3, 379 leaves, 22 steps):

$$-\frac{e^x}{2\left(1+e^{8x}\right)}-\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{2}}-2\,e^x}{\sqrt{2+\sqrt{2}}}\right]}{8\sqrt{2\left(2-\sqrt{2}\right)}}-$$

$$\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}}-2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{8\sqrt{2\left(2+\sqrt{2}\right)}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{2}}+2\,e^x}{\sqrt{2+\sqrt{2}}}\right]}{8\sqrt{2\left(2-\sqrt{2}\right)}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{2}}+2\,e^x}{\sqrt{2-\sqrt{2}}}\right]}{8\sqrt{2\left(2+\sqrt{2}\right)}}-$$

$$\frac{1}{32}\sqrt{2-\sqrt{2}}\;\text{Log}\left[1-\sqrt{2-\sqrt{2}}\;e^x+e^{2x}\right]+\frac{1}{32}\sqrt{2-\sqrt{2}}\;\text{Log}\left[1+\sqrt{2-\sqrt{2}}\;e^x+e^{2x}\right]-$$

$$\frac{1}{32}\sqrt{2+\sqrt{2}}\;\text{Log}\left[1-\sqrt{2+\sqrt{2}}\;e^x+e^{2x}\right]+\frac{1}{32}\sqrt{2+\sqrt{2}}\;\text{Log}\left[1+\sqrt{2+\sqrt{2}}\;e^x+e^{2x}\right]$$

Result (type 7, 48 leaves):

$$-\frac{e^x}{2\left(1+e^{8x}\right)}-\frac{1}{16}\,\text{RootSum}\left[1+\#1^8\,\&,\ \frac{x-\text{Log}\left[e^x-\#1\right]}{\#1^7}\,\&\right]$$

Problem 288: Unable to integrate problem.

$$\int F^{c\,(a+b\,x)}\,\text{Sech}[d+e\,x]\,dx$$

Optimal (type 5, 68 leaves, 1 step):

$$\frac{1}{e+b\,c\,\text{Log}[F]}2\,e^{d+e\,x}\,F^{c\,(a+b\,x)}\,\text{Hypergeometric2F1}\left[1,\frac{e+b\,c\,\text{Log}[F]}{2\,e},\frac{1}{2}\left(3+\frac{b\,c\,\text{Log}[F]}{e}\right),-e^{2\,(d+e\,x)}\right]$$

Result (type 8, 18 leaves):

$$\int F^{c\,(a+b\,x)}\,\text{Sech}[d+e\,x]\,dx$$

Problem 290: Unable to integrate problem.

$$\int F^{c\,(a+b\,x)}\,\text{Sech}[d+e\,x]^3\,dx$$

Optimal (type 5, 124 leaves, 2 steps):

$$\frac{1}{e^2}e^{d+e\,x}\,F^{c\,(a+b\,x)}\,\text{Hypergeometric2F1}\left[1,\frac{e+b\,c\,\text{Log}[F]}{2\,e},\frac{1}{2}\left(3+\frac{b\,c\,\text{Log}[F]}{e}\right),-e^{2\,(d+e\,x)}\right]\left(e-b\,c\,\text{Log}[F]\right)+\frac{b\,c\,F^{c\,(a+b\,x)}\,\text{Log}[F]\,\text{Sech}[d+e\,x]}{2\,e^2}+\frac{F^{c\,(a+b\,x)}\,\text{Sech}[d+e\,x]\,\text{Tanh}[d+e\,x]}{2\,e}$$

Result (type 8, 20 leaves):

$$\int F^{c\,(a+b\,x)}\,\text{Sech}[d+e\,x]^3\,dx$$

Problem 319: Result more than twice size of optimal antiderivative.

$$\int f^{a+c\,x^2}\,\text{Cosh}\left[d+e\,x+f\,x^2\right]^3\,dx$$

Optimal (type 4, 300 leaves, 14 steps):

$$\frac{3\,e^{-d+\frac{e^2}{4\,f-4\,c\,\text{Log}[f]}}\,f^a\,\sqrt{\pi}\,\text{Erf}\left[\frac{e+2\,x\,(f-c\,\text{Log}[f])}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]}{16\,\sqrt{f-c\,\text{Log}[f]}}+\frac{e^{-3\,d+\frac{9\,e^2}{12\,f-4\,c\,\text{Log}[f]}}\,f^a\,\sqrt{\pi}\,\text{Erf}\left[\frac{3\,e+2\,x\,(3\,f-c\,\text{Log}[f])}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]}{16\,\sqrt{3\,f-c\,\text{Log}[f]}}+$$
$$\frac{3\,e^{d-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f^a\,\sqrt{\pi}\,\text{Erfi}\left[\frac{e+2\,x\,(f+c\,\text{Log}[f])}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]}{16\,\sqrt{f+c\,\text{Log}[f]}}+\frac{e^{3\,d-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^a\,\sqrt{\pi}\,\text{Erfi}\left[\frac{3\,e+2\,x\,(3\,f+c\,\text{Log}[f])}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]}{16\,\sqrt{3\,f+c\,\text{Log}[f]}}$$

Result (type 4, 2303 leaves):

$$\frac{1}{16\,(f-c\,\text{Log}[f])\,(3\,f-c\,\text{Log}[f])\,(f+c\,\text{Log}[f])\,(3\,f+c\,\text{Log}[f])}$$
$$f^a\,\sqrt{\pi}\,\left(27\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,f^3\,\text{Cosh}[d]\,\text{Erf}\left[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]\sqrt{f-c\,\text{Log}[f]}\right.+$$

$$27\,c\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,f^2\,\text{Cosh}[d]\,\text{Erf}\Big[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]\,\sqrt{f-c\,\text{Log}[f]}\,-$$

$$3\,c^2\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,f\,\text{Cosh}[d]\,\text{Erf}\Big[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^2\,\sqrt{f-c\,\text{Log}[f]}\,-$$

$$3\,c^3\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,\text{Cosh}[d]\,\text{Erf}\Big[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^3\,\sqrt{f-c\,\text{Log}[f]}\,+$$

$$3\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f^3\,\text{Cosh}[3\,d]\,\text{Erf}\Big[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\Big]\,\sqrt{3\,f-c\,\text{Log}[f]}\,+$$

$$c\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f^2\,\text{Cosh}[3\,d]\,\text{Erf}\Big[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]\,\sqrt{3\,f-c\,\text{Log}[f]}\,-$$

$$3\,c^2\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f\,\text{Cosh}[3\,d]\,\text{Erf}\Big[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^2\,\sqrt{3\,f-c\,\text{Log}[f]}\,-$$

$$c^3\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,\text{Cosh}[3\,d]\,\text{Erf}\Big[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^3\,\sqrt{3\,f-c\,\text{Log}[f]}\,+$$

$$27\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f^3\,\text{Cosh}[d]\,\text{Erfi}\Big[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\Big]\,\sqrt{f+c\,\text{Log}[f]}\,-$$

$$27\,c\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f^2\,\text{Cosh}[d]\,\text{Erfi}\Big[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\Big]\,\text{Log}[f]\,\sqrt{f+c\,\text{Log}[f]}\,-$$

$$3\,c^2\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f\,\text{Cosh}[d]\,\text{Erfi}\Big[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^2\,\sqrt{f+c\,\text{Log}[f]}\,+$$

$$3\,c^3\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,\text{Cosh}[d]\,\text{Erfi}\Big[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^3\,\sqrt{f+c\,\text{Log}[f]}\,+$$

$$3\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^3\,\text{Cosh}[3\,d]\,\text{Erfi}\Big[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\Big]\,\sqrt{3\,f+c\,\text{Log}[f]}\,-$$

$$c\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^2\,\text{Cosh}[3\,d]\,\text{Erfi}\Big[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\Big]\,\text{Log}[f]\,\sqrt{3\,f+c\,\text{Log}[f]}\,-$$

$$3\,c^2\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f\,\text{Cosh}[3\,d]\,\text{Erfi}\Big[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^2\,\sqrt{3\,f+c\,\text{Log}[f]}\,+$$

$$c^3\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,\text{Cosh}[3\,d]\,\text{Erfi}\Big[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^3\,\sqrt{3\,f+c\,\text{Log}[f]}\,-$$

$$27\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,f^3\,\text{Erf}\Big[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\Big]\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,-$$

$$27\,c\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,f^2\,\text{Erf}\Big[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,+$$

$$3\,c^2\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,f\,\text{Erf}\Big[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\Big]\,\text{Log}[f]^2\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,+$$

$$3\,c^3\,e^{\frac{e^2}{4\,(f-c\,\text{Log}[f])}}\,\text{Erf}\left[\frac{e+2\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{f-c\,\text{Log}[f]}\,\,\text{Sinh}[d]\,+$$

$$27\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f^3\,\text{Erfi}\left[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\sqrt{f+c\,\text{Log}[f]}\,\,\text{Sinh}[d]\,-$$

$$27\,c\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f^2\,\text{Erfi}\left[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{f+c\,\text{Log}[f]}\,\,\text{Sinh}[d]\,-$$

$$3\,c^2\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,f\,\text{Erfi}\left[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{f+c\,\text{Log}[f]}\,\,\text{Sinh}[d]\,+$$

$$3\,c^3\,e^{-\frac{e^2}{4\,(f+c\,\text{Log}[f])}}\,\text{Erfi}\left[\frac{e+2\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{f+c\,\text{Log}[f]}\,\,\text{Sinh}[d]\,-$$

$$3\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f^3\,\text{Erf}\left[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]\,\sqrt{3\,f-c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,-$$

$$c\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f^2\,\text{Erf}\left[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{3\,f-c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,+$$

$$3\,c^2\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f\,\text{Erf}\left[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{3\,f-c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,+$$

$$c^3\,e^{\frac{9\,e^2}{4\,(3\,f-c\,\text{Log}[f])}}\,\text{Erf}\left[\frac{3\,e+6\,f\,x-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{3\,f-c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,+$$

$$3\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^3\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\sqrt{3\,f+c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,-$$

$$c\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^2\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{3\,f+c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,-$$

$$3\,c^2\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{3\,f+c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\,+$$

$$c^3\,e^{-\frac{9\,e^2}{4\,(3\,f+c\,\text{Log}[f])}}\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{3\,f+c\,\text{Log}[f]}\,\,\text{Sinh}[3\,d]\Bigg)$$

Problem 325: Result more than twice size of optimal antiderivative.

$$\int f^{a+b\,x+c\,x^2}\,\text{Cosh}\left[d+f\,x^2\right]^3\,dx$$

Optimal (type 4, 323 leaves, 14 steps):

$$-\frac{3\, e^{-d+\frac{b^2 \text{Log}[f]^2}{4 f-4 c \text{Log}[f]}} f^a \sqrt{\pi}\, \text{Erf}\left[\frac{b \text{Log}[f]-2 x (f-c \text{Log}[f])}{2 \sqrt{f-c \text{Log}[f]}}\right]}{16 \sqrt{f-c \text{Log}[f]}}-\frac{e^{-3 d+\frac{b^2 \text{Log}[f]^2}{12 f-4 c \text{Log}[f]}} f^a \sqrt{\pi}\, \text{Erf}\left[\frac{b \text{Log}[f]-2 x (3 f-c \text{Log}[f])}{2 \sqrt{3 f-c \text{Log}[f]}}\right]}{16 \sqrt{3 f-c \text{Log}[f]}}+$$

$$\frac{3\, e^{d-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f^a \sqrt{\pi}\, \text{Erfi}\left[\frac{b \text{Log}[f]+2 x (f+c \text{Log}[f])}{2 \sqrt{f+c \text{Log}[f]}}\right]}{16 \sqrt{f+c \text{Log}[f]}}+\frac{e^{3 d-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^a \sqrt{\pi}\, \text{Erfi}\left[\frac{b \text{Log}[f]+2 x (3 f+c \text{Log}[f])}{2 \sqrt{3 f+c \text{Log}[f]}}\right]}{16 \sqrt{3 f+c \text{Log}[f]}}$$

Result (type 4, 2511 leaves):

$$\frac{1}{16 (f-c \text{Log}[f]) (3 f-c \text{Log}[f]) (f+c \text{Log}[f]) (3 f+c \text{Log}[f])}$$

$$f^a \sqrt{\pi} \left(27\, e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} f^3 \text{Cosh}[d]\, \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \sqrt{f-c \text{Log}[f]}\right.+$$

$$27 c\, e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} f^2 \text{Cosh}[d]\, \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{f-c \text{Log}[f]}-$$

$$3 c^2 e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} f\, \text{Cosh}[d]\, \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{f-c \text{Log}[f]}-$$

$$3 c^3 e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} \text{Cosh}[d]\, \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{f-c \text{Log}[f]}+$$

$$3\, e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f^3 \text{Cosh}[3 d]\, \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \sqrt{3 f-c \text{Log}[f]}+$$

$$c\, e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f^2 \text{Cosh}[3 d]\, \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{3 f-c \text{Log}[f]}-$$

$$3 c^2 e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f\, \text{Cosh}[3 d]\, \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{3 f-c \text{Log}[f]}-$$

$$c^3 e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} \text{Cosh}[3 d]\, \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{3 f-c \text{Log}[f]}+$$

$$27\, e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f^3 \text{Cosh}[d]\, \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \sqrt{f+c \text{Log}[f]}-$$

$$27 c\, e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f^2 \text{Cosh}[d]\, \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{f+c \text{Log}[f]}-$$

$$3 c^2 e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f\, \text{Cosh}[d]\, \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{f+c \text{Log}[f]}+$$

$$3 c^3 e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} \text{Cosh}[d]\, \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{f+c \text{Log}[f]}+$$

$$3\, e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^3 \text{Cosh}[3 d]\, \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \sqrt{3 f+c \text{Log}[f]}-$$

$$c\, e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^2 \text{Cosh}[3 d] \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{3 f+c \text{Log}[f]} -$$

$$3 c^2 e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f \text{Cosh}[3 d] \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{3 f+c \text{Log}[f]} +$$

$$c^3 e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} \text{Cosh}[3 d] \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{3 f+c \text{Log}[f]} -$$

$$27 e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} f^3 \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \sqrt{f-c \text{Log}[f]} \text{Sinh}[d] -$$

$$27 c\, e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} f^2 \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{f-c \text{Log}[f]} \text{Sinh}[d] +$$

$$3 c^2 e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} f \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{f-c \text{Log}[f]} \text{Sinh}[d] +$$

$$3 c^3 e^{\frac{b^2 \text{Log}[f]^2}{4 (f-c \text{Log}[f])}} \text{Erf}\left[\frac{2 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{f-c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{f-c \text{Log}[f]} \text{Sinh}[d] +$$

$$27 e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f^3 \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \sqrt{f+c \text{Log}[f]} \text{Sinh}[d] -$$

$$27 c\, e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f^2 \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{f+c \text{Log}[f]} \text{Sinh}[d] -$$

$$3 c^2 e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} f \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{f+c \text{Log}[f]} \text{Sinh}[d] +$$

$$3 c^3 e^{-\frac{b^2 \text{Log}[f]^2}{4 (f+c \text{Log}[f])}} \text{Erfi}\left[\frac{2 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{f+c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{f+c \text{Log}[f]} \text{Sinh}[d] -$$

$$3 e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f^3 \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \sqrt{3 f-c \text{Log}[f]} \text{Sinh}[3 d] -$$

$$c\, e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f^2 \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{3 f-c \text{Log}[f]} \text{Sinh}[3 d] +$$

$$3 c^2 e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{3 f-c \text{Log}[f]} \text{Sinh}[3 d] +$$

$$c^3 e^{\frac{b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} \text{Erf}\left[\frac{6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{3 f-c \text{Log}[f]} \text{Sinh}[3 d] +$$

$$3 e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^3 \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \sqrt{3 f+c \text{Log}[f]} \text{Sinh}[3 d] -$$

$$c\, e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^2 \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{3 f+c \text{Log}[f]} \text{Sinh}[3 d] -$$

$$3 c^2 e^{-\frac{b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f \text{Erfi}\left[\frac{6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f]^2 \sqrt{3 f+c \text{Log}[f]} \text{Sinh}[3 d] +$$

$$c^3\, e^{-\frac{b^2 \operatorname{Log}[f]^2}{4\,(3 f+c \operatorname{Log}[f])}} \operatorname{Erfi}\left[\frac{6 f x+b \operatorname{Log}[f]+2 c x \operatorname{Log}[f]}{2 \sqrt{3 f+c \operatorname{Log}[f]}}\right] \operatorname{Log}[f]^3 \sqrt{3 f+c \operatorname{Log}[f]} \operatorname{Sinh}[3 d]\Big)$$

Problem 327: Result more than twice size of optimal antiderivative.

$$\int f^{a+b x+c x^2} \operatorname{Cosh}\left[d+e x+f x^2\right]^2 \, dx$$

Optimal (type 4, 239 leaves, 10 steps):

$$\frac{f^{a-\frac{b^2}{4 c}} \sqrt{\pi}\, \operatorname{Erfi}\left[\frac{(b+2 c x) \sqrt{\operatorname{Log}[f]}}{2 \sqrt{c}}\right]}{4 \sqrt{c}\, \sqrt{\operatorname{Log}[f]}}+\frac{e^{-2 d+\frac{(2 e-b \operatorname{Log}[f])^2}{8 f-4 c \operatorname{Log}[f]}} f^a \sqrt{\pi}\, \operatorname{Erf}\left[\frac{2 e-b \operatorname{Log}[f]+2 x\,(2 f-c \operatorname{Log}[f])}{2 \sqrt{2 f-c \operatorname{Log}[f]}}\right]}{8 \sqrt{2 f-c \operatorname{Log}[f]}}+$$

$$\frac{e^{2 d-\frac{(2 e+b \operatorname{Log}[f])^2}{8 f+4 c \operatorname{Log}[f]}} f^a \sqrt{\pi}\, \operatorname{Erfi}\left[\frac{2 e+b \operatorname{Log}[f]+2 x\,(2 f+c \operatorname{Log}[f])}{2 \sqrt{2 f+c \operatorname{Log}[f]}}\right]}{8 \sqrt{2 f+c \operatorname{Log}[f]}}$$

Result (type 4, 912 leaves):

$$\begin{aligned}
&\frac{1}{8\,c\,\text{Log}[f]\,\left(2\,f-c\,\text{Log}[f]\right)\,\left(2\,f+c\,\text{Log}[f]\right)}\\
&f^a\,\sqrt{\pi}\,\left(8\,\sqrt{c}\,f^{2-\frac{b^2}{4\,c}}\,\text{Erfi}\left[\frac{(b+2\,c\,x)\,\sqrt{\text{Log}[f]}}{2\,\sqrt{c}}\right]\,\sqrt{\text{Log}[f]}\,-\right.\\
&\quad 2\,c^{5/2}\,f^{-\frac{b^2}{4\,c}}\,\text{Erfi}\left[\frac{(b+2\,c\,x)\,\sqrt{\text{Log}[f]}}{2\,\sqrt{c}}\right]\,\text{Log}[f]^{5/2}+2\,c\,e^{-\frac{-4\,e^2+4\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(2\,f-c\,\text{Log}[f])}}\,f\,\text{Cosh}[2\,d]\\
&\quad \text{Erf}\left[\frac{2\,e+4\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{2\,f-c\,\text{Log}[f]}+c^2\,e^{-\frac{-4\,e^2+4\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(2\,f-c\,\text{Log}[f])}}\\
&\quad \text{Cosh}[2\,d]\,\text{Erf}\left[\frac{2\,e+4\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{2\,f-c\,\text{Log}[f]}\,+\\
&\quad 2\,c\,e^{-\frac{4\,e^2+4\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(2\,f+c\,\text{Log}[f])}}\,f\,\text{Cosh}[2\,d]\,\text{Erfi}\left[\frac{2\,e+4\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f+c\,\text{Log}[f]}}\right]\\
&\quad \text{Log}[f]\,\sqrt{2\,f+c\,\text{Log}[f]}-c^2\,e^{-\frac{4\,e^2+4\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(2\,f+c\,\text{Log}[f])}}\,\text{Cosh}[2\,d]\\
&\quad \text{Erfi}\left[\frac{2\,e+4\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{2\,f+c\,\text{Log}[f]}-2\,c\,e^{-\frac{-4\,e^2+4\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(2\,f-c\,\text{Log}[f])}}\\
&\quad f\,\text{Erf}\left[\frac{2\,e+4\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{2\,f-c\,\text{Log}[f]}\,\text{Sinh}[2\,d]\,-\\
&\quad c^2\,e^{-\frac{-4\,e^2+4\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(2\,f-c\,\text{Log}[f])}}\,\text{Erf}\left[\frac{2\,e+4\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{2\,f-c\,\text{Log}[f]}\\
&\quad \text{Sinh}[2\,d]+2\,c\,e^{-\frac{4\,e^2+4\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(2\,f+c\,\text{Log}[f])}}\,f\,\text{Erfi}\left[\frac{2\,e+4\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f+c\,\text{Log}[f]}}\right]\\
&\quad \text{Log}[f]\,\sqrt{2\,f+c\,\text{Log}[f]}\,\text{Sinh}[2\,d]-c^2\,e^{-\frac{4\,e^2+4\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(2\,f+c\,\text{Log}[f])}}\\
&\quad \left.\text{Erfi}\left[\frac{2\,e+4\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{2\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{2\,f+c\,\text{Log}[f]}\,\text{Sinh}[2\,d]\right)
\end{aligned}$$

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

$$\int f^{a+b\,x+c\,x^2}\,\text{Cosh}\left[d+e\,x+f\,x^2\right]^3\,dx$$

Optimal (type 4, 344 leaves, 14 steps):

$$\frac{3\, e^{-d+\frac{(e-b\,\mathrm{Log}[f])^2}{4\,(f-c\,\mathrm{Log}[f])}}\, f^a \sqrt{\pi}\, \mathrm{Erf}\left[\frac{e-b\,\mathrm{Log}[f]+2\,x\,(f-c\,\mathrm{Log}[f])}{2\sqrt{f-c\,\mathrm{Log}[f]}}\right]}{16\sqrt{f-c\,\mathrm{Log}[f]}}+$$

$$\frac{e^{-3\,d+\frac{(3\,e-b\,\mathrm{Log}[f])^2}{12\,f-4\,c\,\mathrm{Log}[f]}}\, f^a \sqrt{\pi}\, \mathrm{Erf}\left[\frac{3\,e-b\,\mathrm{Log}[f]+2\,x\,(3\,f-c\,\mathrm{Log}[f])}{2\sqrt{3\,f-c\,\mathrm{Log}[f]}}\right]}{16\sqrt{3\,f-c\,\mathrm{Log}[f]}}+$$

$$\frac{3\, e^{d-\frac{(e+b\,\mathrm{Log}[f])^2}{4\,(f+c\,\mathrm{Log}[f])}}\, f^a \sqrt{\pi}\, \mathrm{Erfi}\left[\frac{e+b\,\mathrm{Log}[f]+2\,x\,(f+c\,\mathrm{Log}[f])}{2\sqrt{f+c\,\mathrm{Log}[f]}}\right]}{16\sqrt{f+c\,\mathrm{Log}[f]}}+$$

$$\frac{e^{3\,d-\frac{(3\,e+b\,\mathrm{Log}[f])^2}{4\,(3\,f+c\,\mathrm{Log}[f])}}\, f^a \sqrt{\pi}\, \mathrm{Erfi}\left[\frac{3\,e+b\,\mathrm{Log}[f]+2\,x\,(3\,f+c\,\mathrm{Log}[f])}{2\sqrt{3\,f+c\,\mathrm{Log}[f]}}\right]}{16\sqrt{3\,f+c\,\mathrm{Log}[f]}}$$

Result (type 4, 2991 leaves):

$$\frac{1}{16\,(f-c\,\mathrm{Log}[f])\,(3\,f-c\,\mathrm{Log}[f])\,(f+c\,\mathrm{Log}[f])\,(3\,f+c\,\mathrm{Log}[f])}$$

$$f^a\sqrt{\pi}\left(27\, e^{-\frac{-e^2+2\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(f-c\,\mathrm{Log}[f])}}\, f^3\, \mathrm{Cosh}[d]\, \mathrm{Erf}\left[\frac{e+2\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{f-c\,\mathrm{Log}[f]}}\right]\sqrt{f-c\,\mathrm{Log}[f]}+\right.$$

$$27\,c\, e^{-\frac{-e^2+2\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(f-c\,\mathrm{Log}[f])}}\, f^2\, \mathrm{Cosh}[d]\, \mathrm{Erf}\left[\frac{e+2\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{f-c\,\mathrm{Log}[f]}}\right]\mathrm{Log}[f]\sqrt{f-c\,\mathrm{Log}[f]}-$$

$$3\,c^2\, e^{-\frac{-e^2+2\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(f-c\,\mathrm{Log}[f])}}\, f\, \mathrm{Cosh}[d]\, \mathrm{Erf}\left[\frac{e+2\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{f-c\,\mathrm{Log}[f]}}\right]\mathrm{Log}[f]^2\sqrt{f-c\,\mathrm{Log}[f]}-$$

$$3\,c^3\, e^{-\frac{-e^2+2\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(f-c\,\mathrm{Log}[f])}}\, \mathrm{Cosh}[d]\, \mathrm{Erf}\left[\frac{e+2\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{f-c\,\mathrm{Log}[f]}}\right]\mathrm{Log}[f]^3\sqrt{f-c\,\mathrm{Log}[f]}+$$

$$3\, e^{-\frac{-9\,e^2+6\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(3\,f-c\,\mathrm{Log}[f])}}\, f^3\, \mathrm{Cosh}[3\,d]\, \mathrm{Erf}\left[\frac{3\,e+6\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{3\,f-c\,\mathrm{Log}[f]}}\right]\sqrt{3\,f-c\,\mathrm{Log}[f]}+$$

$$c\, e^{-\frac{-9\,e^2+6\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(3\,f-c\,\mathrm{Log}[f])}}\, f^2\, \mathrm{Cosh}[3\,d]\, \mathrm{Erf}\left[\frac{3\,e+6\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{3\,f-c\,\mathrm{Log}[f]}}\right]$$

$$\mathrm{Log}[f]\sqrt{3\,f-c\,\mathrm{Log}[f]}-3\,c^2\, e^{-\frac{-9\,e^2+6\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(3\,f-c\,\mathrm{Log}[f])}}\, f\, \mathrm{Cosh}[3\,d]$$

$$\mathrm{Erf}\left[\frac{3\,e+6\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{3\,f-c\,\mathrm{Log}[f]}}\right]\mathrm{Log}[f]^2\sqrt{3\,f-c\,\mathrm{Log}[f]}-c^3\, e^{-\frac{-9\,e^2+6\,b\,e\,\mathrm{Log}[f]-b^2\,\mathrm{Log}[f]^2}{4\,(3\,f-c\,\mathrm{Log}[f])}}$$

$$\mathrm{Cosh}[3\,d]\, \mathrm{Erf}\left[\frac{3\,e+6\,f\,x-b\,\mathrm{Log}[f]-2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{3\,f-c\,\mathrm{Log}[f]}}\right]\mathrm{Log}[f]^3\sqrt{3\,f-c\,\mathrm{Log}[f]}+$$

$$27\, e^{-\frac{e^2+2\,b\,e\,\mathrm{Log}[f]+b^2\,\mathrm{Log}[f]^2}{4\,(f+c\,\mathrm{Log}[f])}}\, f^3\, \mathrm{Cosh}[d]\, \mathrm{Erfi}\left[\frac{e+2\,f\,x+b\,\mathrm{Log}[f]+2\,c\,x\,\mathrm{Log}[f]}{2\sqrt{f+c\,\mathrm{Log}[f]}}\right]\sqrt{f+c\,\mathrm{Log}[f]}-$$

$$27\,c\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,f^2\,\text{Cosh}[d]\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{f+c\,\text{Log}[f]}\,-$$
$$3\,c^2\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,f\,\text{Cosh}[d]\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{f+c\,\text{Log}[f]}\,+$$
$$3\,c^3\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,\text{Cosh}[d]\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{f+c\,\text{Log}[f]}\,+$$
$$3\,e^{-\frac{9\,e^2+6\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^3\,\text{Cosh}[3\,d]\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\sqrt{3\,f+c\,\text{Log}[f]}\,-$$
$$c\,e^{-\frac{9\,e^2+6\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f^2\,\text{Cosh}[3\,d]\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]$$
$$\text{Log}[f]\,\sqrt{3\,f+c\,\text{Log}[f]}\,-3\,c^2\,e^{-\frac{9\,e^2+6\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(3\,f+c\,\text{Log}[f])}}\,f\,\text{Cosh}[3\,d]$$
$$\text{Erfi}\left[\frac{3\,e+6\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{3\,f+c\,\text{Log}[f]}\,+c^3\,e^{-\frac{9\,e^2+6\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(3\,f+c\,\text{Log}[f])}}$$
$$\text{Cosh}[3\,d]\,\text{Erfi}\left[\frac{3\,e+6\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{3\,f+c\,\text{Log}[f]}\,-$$
$$27\,e^{-\frac{-e^2+2\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(f-c\,\text{Log}[f])}}\,f^3\,\text{Erf}\left[\frac{e+2\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,-$$
$$27\,c\,e^{-\frac{-e^2+2\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(f-c\,\text{Log}[f])}}\,f^2\,\text{Erf}\left[\frac{e+2\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,+$$
$$3\,c^2\,e^{-\frac{-e^2+2\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(f-c\,\text{Log}[f])}}\,f\,\text{Erf}\left[\frac{e+2\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,+$$
$$3\,c^3\,e^{-\frac{-e^2+2\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(f-c\,\text{Log}[f])}}\,\text{Erf}\left[\frac{e+2\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{f-c\,\text{Log}[f]}\,\text{Sinh}[d]\,+$$
$$27\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,f^3\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\sqrt{f+c\,\text{Log}[f]}\,\text{Sinh}[d]\,-$$
$$27\,c\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,f^2\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{f+c\,\text{Log}[f]}\,\text{Sinh}[d]\,-$$
$$3\,c^2\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,f\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^2\,\sqrt{f+c\,\text{Log}[f]}\,\text{Sinh}[d]\,+$$
$$3\,c^3\,e^{-\frac{e^2+2\,b\,e\,\text{Log}[f]+b^2\,\text{Log}[f]^2}{4\,(f+c\,\text{Log}[f])}}\,\text{Erfi}\left[\frac{e+2\,f\,x+b\,\text{Log}[f]+2\,c\,x\,\text{Log}[f]}{2\,\sqrt{f+c\,\text{Log}[f]}}\right]\,\text{Log}[f]^3\,\sqrt{f+c\,\text{Log}[f]}\,\text{Sinh}[d]\,-$$
$$3\,e^{-\frac{-9\,e^2+6\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f^3\,\text{Erf}\left[\frac{3\,e+6\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]\,\sqrt{3\,f-c\,\text{Log}[f]}\,\text{Sinh}[3\,d]\,-$$
$$c\,e^{-\frac{-9\,e^2+6\,b\,e\,\text{Log}[f]-b^2\,\text{Log}[f]^2}{4\,(3\,f-c\,\text{Log}[f])}}\,f^2\,\text{Erf}\left[\frac{3\,e+6\,f\,x-b\,\text{Log}[f]-2\,c\,x\,\text{Log}[f]}{2\,\sqrt{3\,f-c\,\text{Log}[f]}}\right]\,\text{Log}[f]\,\sqrt{3\,f-c\,\text{Log}[f]}$$

$$\text{Sinh}[3 d] + 3 c^2 e^{-\frac{-9 e^2+6 b e \text{Log}[f]-b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}} f \,\text{Erf}\left[\frac{3 e+6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right]$$

$$\text{Log}[f]^2 \sqrt{3 f-c \text{Log}[f]}\ \text{Sinh}[3 d] + c^3 e^{-\frac{-9 e^2+6 b e \text{Log}[f]-b^2 \text{Log}[f]^2}{4 (3 f-c \text{Log}[f])}}$$

$$\text{Erf}\left[\frac{3 e+6 f x-b \text{Log}[f]-2 c x \text{Log}[f]}{2 \sqrt{3 f-c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{3 f-c \text{Log}[f]}\ \text{Sinh}[3 d] +$$

$$3 e^{-\frac{9 e^2+6 b e \text{Log}[f]+b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^3 \,\text{Erfi}\left[\frac{3 e+6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \sqrt{3 f+c \text{Log}[f]}\ \text{Sinh}[3 d] -$$

$$c\, e^{-\frac{9 e^2+6 b e \text{Log}[f]+b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f^2 \,\text{Erfi}\left[\frac{3 e+6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f] \sqrt{3 f+c \text{Log}[f]}$$

$$\text{Sinh}[3 d] - 3 c^2 e^{-\frac{9 e^2+6 b e \text{Log}[f]+b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}} f \,\text{Erfi}\left[\frac{3 e+6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right]$$

$$\text{Log}[f]^2 \sqrt{3 f+c \text{Log}[f]}\ \text{Sinh}[3 d] + c^3 e^{-\frac{9 e^2+6 b e \text{Log}[f]+b^2 \text{Log}[f]^2}{4 (3 f+c \text{Log}[f])}}$$

$$\left.\text{Erfi}\left[\frac{3 e+6 f x+b \text{Log}[f]+2 c x \text{Log}[f]}{2 \sqrt{3 f+c \text{Log}[f]}}\right] \text{Log}[f]^3 \sqrt{3 f+c \text{Log}[f]}\ \text{Sinh}[3 d]\right)$$

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

$$\int \left(\frac{x}{\text{Cosh}[x]^{3/2}} + x \sqrt{\text{Cosh}[x]}\right) dx$$

Optimal (type 3, 20 leaves, 2 steps):

$$-4 \sqrt{\text{Cosh}[x]} + \frac{2 x \,\text{Sinh}[x]}{\sqrt{\text{Cosh}[x]}}$$

Result (type 3, 46 leaves):

$$\frac{2 \,\text{Sinh}[x] \left(x - \frac{2 \,\text{Cosh}[x] \,\text{Sinh}[x] \sqrt{\text{Tanh}\left[\frac{x}{2}\right]^2}}{(-1+\text{Cosh}[x])^{3/2} \sqrt{1+\text{Cosh}[x]}}\right)}{\sqrt{\text{Cosh}[x]}}$$

Problem 332: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(\frac{x^2}{\text{Cosh}[x]^{3/2}} + x^2 \sqrt{\text{Cosh}[x]}\right) dx$$

Optimal (type 4, 36 leaves, 3 steps):

$$-8 x \sqrt{\text{Cosh}[x]} - 16 i \,\text{EllipticE}\left[\frac{i x}{2}, 2\right] + \frac{2 x^2 \,\text{Sinh}[x]}{\sqrt{\text{Cosh}[x]}}$$

Result (type 5, 76 leaves):

$$\frac{1}{1+e^{2x}}4\sqrt{\text{Cosh}[x]}\ (\text{Cosh}[x]+\text{Sinh}[x])\ \Big(-4\ (-2+x)\ \text{Cosh}[x]+x^2\,\text{Sinh}[x]+ 8\,\text{Hypergeometric2F1}\Big[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2x}\Big]\ (-\text{Cosh}[x]+\text{Sinh}[x])\ \sqrt{1+\text{Cosh}[2x]+\text{Sinh}[2x]}\Big)$$

Problem 335: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Cosh}[a+b\,x]}{c+d\,x^2}\,dx$$

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

$$\frac{\text{Cosh}\Big[a+\frac{b\sqrt{-c}}{\sqrt{d}}\Big]\ \text{CoshIntegral}\Big[\frac{b\sqrt{-c}}{\sqrt{d}}-b\,x\Big]}{2\sqrt{-c}\ \sqrt{d}}-\frac{\text{Cosh}\Big[a-\frac{b\sqrt{-c}}{\sqrt{d}}\Big]\ \text{CoshIntegral}\Big[\frac{b\sqrt{-c}}{\sqrt{d}}+b\,x\Big]}{2\sqrt{-c}\ \sqrt{d}}-\frac{\text{Sinh}\Big[a+\frac{b\sqrt{-c}}{\sqrt{d}}\Big]\ \text{SinhIntegral}\Big[\frac{b\sqrt{-c}}{\sqrt{d}}-b\,x\Big]}{2\sqrt{-c}\ \sqrt{d}}-\frac{\text{Sinh}\Big[a-\frac{b\sqrt{-c}}{\sqrt{d}}\Big]\ \text{SinhIntegral}\Big[\frac{b\sqrt{-c}}{\sqrt{d}}+b\,x\Big]}{2\sqrt{-c}\ \sqrt{d}}$$

Result (type 4, 180 leaves):

$$\frac{1}{2\sqrt{c}\ \sqrt{d}}\,i\,\Bigg(\text{Cosh}\Big[a-\frac{i\,b\sqrt{c}}{\sqrt{d}}\Big]\ \text{CosIntegral}\Big[-\frac{b\sqrt{c}}{\sqrt{d}}+i\,b\,x\Big]-\text{Cosh}\Big[a+\frac{i\,b\sqrt{c}}{\sqrt{d}}\Big]\ \text{CosIntegral}\Big[\frac{b\sqrt{c}}{\sqrt{d}}+i\,b\,x\Big]+ i\,\Bigg(\text{Sinh}\Big[a-\frac{i\,b\sqrt{c}}{\sqrt{d}}\Big]\ \text{SinIntegral}\Big[\frac{b\sqrt{c}}{\sqrt{d}}-i\,b\,x\Big]+ \text{Sinh}\Big[a+\frac{i\,b\sqrt{c}}{\sqrt{d}}\Big]\ \text{SinIntegral}\Big[\frac{b\sqrt{c}}{\sqrt{d}}+i\,b\,x\Big]\Bigg)\Bigg)$$

Problem 336: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Cosh}[a+b\,x]}{c+d\,x+e\,x^2}\,dx$$

Optimal (type 4, 271 leaves, 8 steps):

$$\frac{\text{Cosh}\left[a-\frac{b\left(d-\sqrt{d^2-4ce}\right)}{2e}\right]\text{CoshIntegral}\left[\frac{b\left(d-\sqrt{d^2-4ce}\right)}{2e}+bx\right]}{\sqrt{d^2-4ce}}-$$

$$\frac{\text{Cosh}\left[a-\frac{b\left(d+\sqrt{d^2-4ce}\right)}{2e}\right]\text{CoshIntegral}\left[\frac{b\left(d+\sqrt{d^2-4ce}\right)}{2e}+bx\right]}{\sqrt{d^2-4ce}}+$$

$$\frac{\text{Sinh}\left[a-\frac{b\left(d-\sqrt{d^2-4ce}\right)}{2e}\right]\text{SinhIntegral}\left[\frac{b\left(d-\sqrt{d^2-4ce}\right)}{2e}+bx\right]}{\sqrt{d^2-4ce}}-$$

$$\frac{\text{Sinh}\left[a-\frac{b\left(d+\sqrt{d^2-4ce}\right)}{2e}\right]\text{SinhIntegral}\left[\frac{b\left(d+\sqrt{d^2-4ce}\right)}{2e}+bx\right]}{\sqrt{d^2-4ce}}$$

Result (type 4, 248 leaves) :

$$\frac{1}{\sqrt{d^2-4ce}}\left(\text{Cosh}\left[a+\frac{b\left(-d+\sqrt{d^2-4ce}\right)}{2e}\right]\text{CosIntegral}\left[\frac{i b\left(d-\sqrt{d^2-4ce}+2ex\right)}{2e}\right]-\right.$$

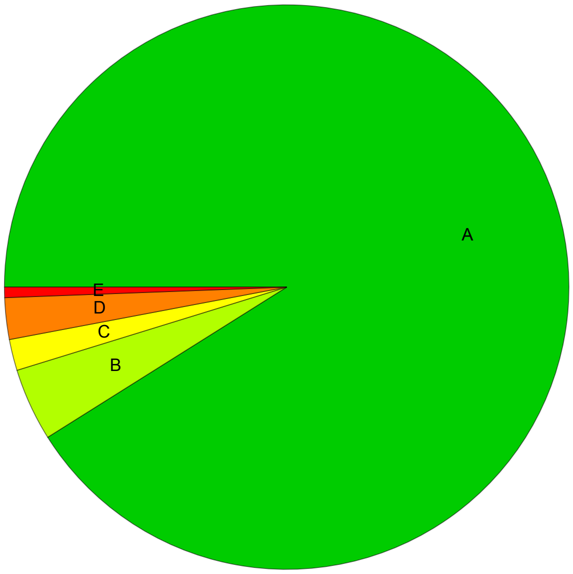
$$\text{Cosh}\left[a-\frac{b\left(d+\sqrt{d^2-4ce}\right)}{2e}\right]\text{CosIntegral}\left[\frac{i b\left(d+\sqrt{d^2-4ce}+2ex\right)}{2e}\right]-$$

$$\text{Sinh}\left[a-\frac{b\left(d+\sqrt{d^2-4ce}\right)}{2e}\right]\text{SinhIntegral}\left[\frac{b\left(d+\sqrt{d^2-4ce}+2ex\right)}{2e}\right]+$$

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

Summary of Integration Test Results

336 integration problems



A - 306 optimal antiderivatives

B - 14 more than twice size of optimal antiderivatives

C - 6 unnecessarily complex antiderivatives

D - 8 unable to integrate problems

E - 2 integration timeouts