Mathematica 11.3 Integration Test Results

Test results for the 77 problems in "6.3.1 (c+d x)^m (a+b tanh)^n.m"

Problem 3: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c+d x) \operatorname{Tanh}[e+f x] \, dx$$

Optimal (type 4, 57 leaves, 4 steps):

$$-\frac{(c+d x)^2}{2 d}+\frac{(c+d x) \operatorname{Log}\left[1+e^{2 (e+f x)}\right]}{f}+\frac{d \operatorname{PolyLog}\left[2,-e^{2 (e+f x)}\right]}{2 f^2}$$

Result (type 4, 211 leaves):

$$\frac{c \operatorname{Log}[\operatorname{Cosh}[e+f x]]}{f}-\left(d \operatorname{Csch}[e]\left(-e^{-\operatorname{ArcTanh}[\operatorname{Coth}[e]]} f^2 x^2+\left(i \operatorname{Coth}[e]\left(-f x\left(-\pi+2 i \operatorname{ArcTanh}[\operatorname{Coth}[e]]\right)-\pi \operatorname{Log}\left[1+e^{2 f x}\right]-2\left(i f x+i \operatorname{ArcTanh}[\operatorname{Coth}[e]]\right) \operatorname{Log}\left[1-e^{2 i (i f x+i \operatorname{ArcTanh}[\operatorname{Coth}[e]])}\right]+\pi \operatorname{Log}[\operatorname{Cosh}[f x]]+2 i \operatorname{ArcTanh}[\operatorname{Coth}[e]] \operatorname{Log}[i \operatorname{Sinh}[f x+\operatorname{ArcTanh}[\operatorname{Coth}[e]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (i f x+i \operatorname{ArcTanh}[\operatorname{Coth}[e]])}\right]\right)\right) \Big/ \left(\sqrt{1-\operatorname{Coth}[e]^2}\right)\right) \operatorname{Sech}[e]\right) \Big/ \left(2 f^2 \sqrt{\operatorname{Csch}[e]^2\left(-\operatorname{Cosh}[e]^2+\operatorname{Sinh}[e]^2\right)}\right)+\frac{1}{2} d x^2 \operatorname{Tanh}[e]$$

Problem 7: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c+d x)^2 \operatorname{Tanh}[e+f x]^2 \, dx$$

Optimal (type 4, 88 leaves, 6 steps):

$$-\frac{(c+d x)^2}{f}+\frac{(c+d x)^3}{3 d}+\frac{2 d (c+d x) \operatorname{Log}\left[1+e^{2 (e+f x)}\right]}{f^2}+\frac{d^2 \operatorname{PolyLog}\left[2,-e^{2 (e+f x)}\right]}{f^3}-\frac{(c+d x)^2 \operatorname{Tanh}[e+f x]}{f}$$

Result (type 4, 303 leaves):

$$\frac{1}{3} x \left(3 c^2 + 3 c d x + d^2 x^2\right) + \left(2 c d \,\text{Sech}[e] \left(\text{Cosh}[e] \,\text{Log}[\text{Cosh}[e] \,\text{Cosh}[f x] + \text{Sinh}[e] \,\text{Sinh}[f x]] - f x \,\text{Sinh}[e]\right)\right) \Big/ \left(f^2 \left(\text{Cosh}[e]^2 - \text{Sinh}[e]^2\right)\right) - \left(d^2 \,\text{Csch}[e] \left(-e^{-\text{ArcTanh}[\text{Coth}[e]]} f^2 x^2 + \left(i \,\text{Coth}[e] \left(-f x \left(-\pi + 2 i \,\text{ArcTanh}[\text{Coth}[e]]\right) - \pi \,\text{Log}\left[1 + e^{2 f x}\right] - 2 \left(i f x + i \,\text{ArcTanh}[\text{Coth}[e]]\right) \text{Log}\left[1 - e^{2 i (i f x + i \,\text{ArcTanh}[\text{Coth}[e]])}\right] + \pi \,\text{Log}[\text{Cosh}[f x]] + 2 i \,\text{ArcTanh}[\text{Coth}[e]] \,\text{Log}[i \,\text{Sinh}[f x + \text{ArcTanh}[\text{Coth}[e]]]] + i \,\text{PolyLog}\left[2, e^{2 i (i f x + i \,\text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right) \Big/ \left(\sqrt{1 - \text{Coth}[e]^2}\right)\right) \text{Sech}[e]\right) \Big/ \left(f^3 \sqrt{\text{Csch}[e]^2 \left(-\text{Cosh}[e]^2 + \text{Sinh}[e]^2\right)}\right) + \frac{1}{f} \text{Sech}[e] \,\text{Sech}[e + f x] \left(-c^2 \,\text{Sinh}[f x] - 2 c d x \,\text{Sinh}[f x] - d^2 x^2 \,\text{Sinh}[f x]\right)$$

Problem 11: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c + d x)^3 \,\text{Tanh}[e + f x]^3 \,dx$$

Optimal (type 4, 237 leaves, 13 steps):

$$-\frac{3 d (c + d x)^2}{2 f^2} + \frac{(c + d x)^3}{2 f} - \frac{(c + d x)^4}{4 d} + \frac{3 d^2 (c + d x) \,\text{Log}\left[1 + e^{2 (e+f x)}\right]}{f^3} + \frac{(c + d x)^3 \,\text{Log}\left[1 + e^{2 (e+f x)}\right]}{f} + \frac{3 d^3 \,\text{PolyLog}\left[2, -e^{2 (e+f x)}\right]}{2 f^4} + \frac{3 d (c + d x)^2 \,\text{PolyLog}\left[2, -e^{2 (e+f x)}\right]}{2 f^2} - \frac{3 d^2 (c + d x) \,\text{PolyLog}\left[3, -e^{2 (e+f x)}\right]}{2 f^3} + \frac{3 d^3 \,\text{PolyLog}\left[4, -e^{2 (e+f x)}\right]}{4 f^4} - \frac{3 d (c + d x)^2 \,\text{Tanh}[e + f x]}{2 f^2} - \frac{(c + d x)^3 \,\text{Tanh}[e + f x]^2}{2 f}$$

Result (type 4, 819 leaves):

$$\frac{1}{4 f^3} c\, d^2 e^{-e} \left(-2 f^2 x^2 \left(2 e^{2 e} f x - 3 \left(1 + e^{2 e}\right) \text{Log}\left[1 + e^{2 (e+f x)}\right]\right) + 6 \left(1 + e^{2 e}\right) f x \,\text{PolyLog}\left[2, -e^{2 (e+f x)}\right] - 3 \left(1 + e^{2 e}\right) \text{PolyLog}\left[3, -e^{2 (e+f x)}\right]\right) \text{Sech}[e] + \frac{1}{4} d^3 e^{e} \left(-x^4 + \left(1 + e^{-2 e}\right) x^4 - \frac{1}{2 f^4} e^{-2 e} \left(1 + e^{2 e}\right) \left(2 f^4 x^4 - 4 f^3 x^3 \text{Log}\left[1 + e^{2 (e+f x)}\right] - 6 f^2 x^2 \text{PolyLog}\left[2, -e^{2 (e+f x)}\right] + 6 f x \,\text{PolyLog}\left[3, -e^{2 (e+f x)}\right] - 3 \,\text{PolyLog}\left[4, -e^{2 (e+f x)}\right]\right)\right) \text{Sech}[e] + \frac{(c + d x)^3 \text{Sech}[e + f x]^2}{2 f} +$$

$$\left(3 c\, d^2 \text{Sech}[e] \left(\text{Cosh}[e] \text{Log}[\text{Cosh}[e] \text{Cosh}[f x] + \text{Sinh}[e] \text{Sinh}[f x]] - f x \,\text{Sinh}[e]\right)\right) \Big/ \left(f^3 \left(\text{Cosh}[e]^2 - \text{Sinh}[e]^2\right)\right) +$$

$$\left(c^3 \text{Sech}[e] \left(\text{Cosh}[e] \text{Log}[\text{Cosh}[e] \text{Cosh}[f x] + \text{Sinh}[e] \text{Sinh}[f x]] - f x \,\text{Sinh}[e]\right)\right) \Big/ \left(f \left(\text{Cosh}[e]^2 - \text{Sinh}[e]^2\right)\right) -$$

$$\left(3 d^3 \text{Csch}[e] \left(-e^{-\text{ArcTanh}[\text{Coth}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 - \text{Coth}[e]^2}} i\, \text{Coth}[e] \left(-f x \left(-\pi + 2 i\, \text{ArcTanh}[\text{Coth}[e]]\right) - \pi \text{Log}\left[1 + e^{2 f x}\right] - 2 \left(i f x + i\, \text{ArcTanh}[\text{Coth}[e]]\right) \text{Log}\left[1 - e^{2 i (i f x + i\, \text{ArcTanh}[\text{Coth}[e]])}\right] + \pi \text{Log}[\text{Cosh}[f x]] + 2 i\, \text{ArcTanh}[\text{Coth}[e]] \text{Log}[i\, \text{Sinh}[f x + \text{ArcTanh}[\text{Coth}[e]]]] + i\, \text{PolyLog}\left[2, e^{2 i (i f x + i\, \text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right) \text{Sech}[e]\right) \Big/ \left(2 f^4 \sqrt{\text{Csch}[e]^2 \left(-\text{Cosh}[e]^2 + \text{Sinh}[e]^2\right)}\right) -$$

$$\left(3 c^2 d\, \text{Csch}[e] \left(-e^{-\text{ArcTanh}[\text{Coth}[e]]} f^2 x^2 + \frac{1}{\sqrt{1 - \text{Coth}[e]^2}} i\, \text{Coth}[e] \left(-f x \left(-\pi + 2 i\, \text{ArcTanh}[\text{Coth}[e]]\right) - \pi \text{Log}\left[1 + e^{2 f x}\right] - 2 \left(i f x + i\, \text{ArcTanh}[\text{Coth}[e]]\right) \text{Log}\left[1 - e^{2 i (i f x + i\, \text{ArcTanh}[\text{Coth}[e]])}\right] + \pi \text{Log}[\text{Cosh}[f x]] + 2 i\, \text{ArcTanh}[\text{Coth}[e]] \text{Log}[i\, \text{Sinh}[f x + \text{ArcTanh}[\text{Coth}[e]]]] + i\, \text{PolyLog}\left[2, e^{2 i (i f x + i\, \text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right) \text{Sech}[e]\right) \Big/ \left(2 f^2 \sqrt{\text{Csch}[e]^2 \left(-\text{Cosh}[e]^2 + \text{Sinh}[e]^2\right)}\right) -$$

$$\frac{1}{2 f^2} 3 \,\text{Sech}[e] \,\text{Sech}[e + f x] \left(c^2 d \,\text{Sinh}[f x] + 2 c\, d^2 x \,\text{Sinh}[f x] + d^3 x^2 \text{Sinh}[f x]\right) + \frac{1}{4} x \left(4 c^3 + 6 c^2 d x + 4 c\, d^2 x^2 + d^3 x^3\right) \text{Tanh}[e]$$

Problem 12: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c + d x)^2 \,\text{Tanh}[e + f x]^3 \, dx$$

Optimal (type 4, 157 leaves, 9 steps):

$$\frac{c\,d\,x}{f}+\frac{d^2 x^2}{2\,f}-\frac{(c+d\,x)^3}{3\,d}+\frac{(c+d\,x)^2\,\text{Log}\left[1+e^{2\,(e+f\,x)}\right]}{f}+\frac{d^2\,\text{Log}[\text{Cosh}[e+f\,x]]}{f^3}+\frac{d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{2\,(e+f\,x)}\right]}{f^2}-\frac{d^2\,\text{PolyLog}\left[3,-e^{2\,(e+f\,x)}\right]}{2\,f^3}-\frac{d\,(c+d\,x)\,\text{Tanh}[e+f\,x]}{f^2}-\frac{(c+d\,x)^2\,\text{Tanh}[e+f\,x]^2}{2\,f}$$

Result (type 4, 465 leaves):

$$\frac{1}{12\,f^3}d^2\,e^{-e}\left(-2\,f^2 x^2\left(2\,e^{2\,e} f\,x-3\left(1+e^{2\,e}\right)\text{Log}\left[1+e^{2\,(e+f\,x)}\right]\right)+6\left(1+e^{2\,e}\right)f\,x\,\text{PolyLog}\left[2,-e^{2\,(e+f\,x)}\right]-3\left(1+e^{2\,e}\right)\text{PolyLog}\left[3,-e^{2\,(e+f\,x)}\right]\right)\text{Sech}[e]+\frac{(c+d\,x)^2\,\text{Sech}[e+f\,x]^2}{2\,f}+$$
$$\left(d^2\,\text{Sech}[e]\left(\text{Cosh}[e]\,\text{Log}[\text{Cosh}[e]\,\text{Cosh}[f\,x]+\text{Sinh}[e]\,\text{Sinh}[f\,x]]-f\,x\,\text{Sinh}[e]\right)\right)\Big/\left(f^3\left(\text{Cosh}[e]^2-\text{Sinh}[e]^2\right)\right)+$$
$$\left(c^2\,\text{Sech}[e]\left(\text{Cosh}[e]\,\text{Log}[\text{Cosh}[e]\,\text{Cosh}[f\,x]+\text{Sinh}[e]\,\text{Sinh}[f\,x]]-f\,x\,\text{Sinh}[e]\right)\right)\Big/\left(f\left(\text{Cosh}[e]^2-\text{Sinh}[e]^2\right)\right)-\left(c\,d\,\text{Csch}[e]\left(-e^{-\text{ArcTanh}[\text{Coth}[e]]}f^2 x^2+\frac{1}{\sqrt{1-\text{Coth}[e]^2}}\,i\,\text{Coth}[e]\left(-f\,x\left(-\pi+2\,i\,\text{ArcTanh}[\text{Coth}[e]]\right)-\pi\,\text{Log}\left[1+e^{2\,f\,x}\right]-2\left(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]]\right)\text{Log}\left[1-e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]+\pi\,\text{Log}[\text{Cosh}[f\,x]]+2\,i\,\text{ArcTanh}[\text{Coth}[e]]\,\text{Log}[i\,\text{Sinh}[f\,x+\text{ArcTanh}[\text{Coth}[e]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right)\text{Sech}[e]\right)\Big/\left(f^2\sqrt{\text{Csch}[e]^2\left(-\text{Cosh}[e]^2+\text{Sinh}[e]^2\right)}\right)+$$
$$\frac{\text{Sech}[e]\,\text{Sech}[e+f\,x]\left(-c\,d\,\text{Sinh}[f\,x]-d^2 x\,\text{Sinh}[f\,x]\right)}{f^2}+\frac{1}{3}x\left(3\,c^2+3\,c\,d\,x+d^2 x^2\right)\text{Tanh}[e]$$

Problem 13: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c+d\,x)\,\text{Tanh}[e+f\,x]^3\,dx$$

Optimal (type 4, 100 leaves, 7 steps):

$$\frac{d\,x}{2\,f}-\frac{(c+d\,x)^2}{2\,d}+\frac{(c+d\,x)\,\text{Log}\left[1+e^{2\,(e+f\,x)}\right]}{f}+\frac{d\,\text{PolyLog}\left[2,-e^{2\,(e+f\,x)}\right]}{2\,f^2}-\frac{d\,\text{Tanh}[e+f\,x]}{2\,f^2}-\frac{(c+d\,x)\,\text{Tanh}[e+f\,x]^2}{2\,f}$$

Result (type 4, 264 leaves):

$$\frac{c\,\text{Log}[\text{Cosh}[e+f\,x]]}{f}+\frac{c\,\text{Sech}[e+f\,x]^2}{2\,f}+\frac{d\,x\,\text{Sech}[e+f\,x]^2}{2\,f}-\left(d\,\text{Csch}[e]\left(-e^{-\text{ArcTanh}[\text{Coth}[e]]}\,f^2\,x^2+\frac{1}{\sqrt{1-\text{Coth}[e]^2}}\,i\,\text{Coth}[e]\,\left(-f\,x\,(-\pi+2\,i\,\text{ArcTanh}[\text{Coth}[e]])-\pi\,\text{Log}\left[1+e^{2\,f\,x}\right]-2\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])\,\text{Log}\left[1-e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]+\pi\,\text{Log}[\text{Cosh}[f\,x]]+2\,i\,\text{ArcTanh}[\text{Coth}[e]]\,\text{Log}[i\,\text{Sinh}[f\,x+\text{ArcTanh}[\text{Coth}[e]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]\right)\right)\text{Sech}[e]\right)\Big/\left(2\,f^2\,\sqrt{\text{Csch}[e]^2\,\left(-\text{Cosh}[e]^2+\text{Sinh}[e]^2\right)}\right)-\frac{d\,\text{Sech}[e]\,\text{Sech}[e+f\,x]\,\text{Sinh}[f\,x]}{2\,f^2}+\frac{1}{2}\,d\,x^2\,\text{Tanh}[e]$$

Problem 16: Attempted integration timed out after 120 seconds.

$$\int (c+d\,x)\,(b\,\text{Tanh}[e+f\,x])^{5/2}\,dx$$

Optimal (type 4, 1392 leaves, 44 steps):

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

$$\frac{b^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}\right]}{2\, f^2} -$$

$$\frac{b^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}\right]}{2\, f^2} +$$

$$\frac{(-b)^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right] \text{Log}\left[\frac{2}{1-\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}}\right]}{f^2} -$$

$$\frac{(-b)^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right] \text{Log}\left[\frac{2 \left(\sqrt{b}-\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(1-\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right)}\right]}{2\, f^2} -$$

$$\frac{(-b)^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right] \text{Log}\left[-\frac{2 \left(\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(1-\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right)}\right]}{2\, f^2} -$$

$$\frac{(-b)^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right] \text{Log}\left[\frac{2}{1+\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}}\right]}{f^2} - \frac{b^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b\, \text{Tanh}[e+f\, x]}}\right]}{2\, f^2} -$$

$$\frac{b^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}}\right]}{2\, f^2} + \frac{b^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}\right]}{4\, f^2} +$$

$$\frac{b^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2 \sqrt{b} \left(\sqrt{-b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}\right]}{4\, f^2} +$$

$$\frac{(-b)^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2}{1-\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}}\right]}{2\, f^2} - \frac{(-b)^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2 \left(\sqrt{b}-\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(1-\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right)}\right]}{4\, f^2} -$$

$$\frac{(-b)^{5/2}\, d\, \text{PolyLog}\left[2,\ 1+\frac{2 \left(\sqrt{b}+\sqrt{b\, \text{Tanh}[e+f\, x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(1-\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}\right)}\right]}{4\, f^2} + \frac{(-b)^{5/2}\, d\, \text{PolyLog}\left[2,\ 1-\frac{2}{1+\frac{\sqrt{b\, \text{Tanh}[e+f\, x]}}{\sqrt{-b}}}\right]}{2\, f^2} -$$

$$\frac{4 b^2 d \sqrt{b \operatorname{Tanh}[e+f x]}}{3 f^2}-\frac{2 b (c+d x) (b \operatorname{Tanh}[e+f x])^{3/2}}{3 f}$$

Result (type 1, 1 leaves):

???

Problem 17: Unable to integrate problem.

$$\int (c+d x) (b \operatorname{Tanh}[e+f x])^{3/2} \, dx$$

Optimal (type 4, 1363 leaves, 43 steps):

$$-\frac{2 b^{3/2} d \operatorname{ArcTan}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right]}{f^2}-\frac{(-b)^{3/2} (c+d x) \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{-b}}\right]}{f}-$$
$$\frac{(-b)^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{-b}}\right]^2}{2 f^2}+\frac{2 b^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right]}{f^2}+$$
$$\frac{b^{3/2} (c+d x) \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right]}{f}+\frac{b^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right]^2}{2 f^2}-$$
$$\frac{b^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b \operatorname{Tanh}[e+f x]}}\right]}{f^2}+$$
$$\frac{b^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b \operatorname{Tanh}[e+f x]}}\right]}{f^2}-$$
$$\frac{b^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b \operatorname{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \operatorname{Tanh}[e+f x]}\right)}\right]}{2 f^2}-$$
$$\frac{b^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{b}}\right] \operatorname{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}+\sqrt{b \operatorname{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \operatorname{Tanh}[e+f x]}\right)}\right]}{2 f^2}+$$
$$\frac{(-b)^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{-b}}\right] \operatorname{Log}\left[\frac{2}{1-\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{-b}}}\right]}{f^2}-$$
$$\frac{(-b)^{3/2} d \operatorname{ArcTanh}\left[\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{-b}}\right] \operatorname{Log}\left[\frac{2 \left(\sqrt{b}-\sqrt{b \operatorname{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(1-\frac{\sqrt{b \operatorname{Tanh}[e+f x]}}{\sqrt{-b}}\right)}\right]}{2 f^2}-$$

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

Result (type 8, 20 leaves) :

$$\int (c+d\,x)\,(b\,\text{Tanh}[e+f\,x])^{3/2}\,dx$$

Problem 18: Result unnecessarily involves imaginary or complex numbers.

$$\int (c+d\,x)\sqrt{b\,\text{Tanh}[e+f\,x]}\,dx$$

Optimal (type 4, 1280 leaves, 37 steps) :

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

$$\frac{\sqrt{b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{b}}\right]\ \text{Log}\left[\frac{2\sqrt{b}}{\sqrt{b}-\sqrt{b\ \text{Tanh}[e+f\ x]}}\right]}{f^2}+$$

$$\frac{\sqrt{b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{b}}\right]\ \text{Log}\left[\frac{2\sqrt{b}}{\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}}\right]}{f^2}-$$

$$\frac{\sqrt{b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{b}}\right]\ \text{Log}\left[\frac{2\sqrt{b}\left(\sqrt{-b}-\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}\right]}{2\ f^2}-$$

$$\frac{\sqrt{b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{b}}\right]\ \text{Log}\left[\frac{2\sqrt{b}\left(\sqrt{-b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}\right]}{2\ f^2}+$$

$$\frac{\sqrt{-b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right]\ \text{Log}\left[\frac{2}{1-\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}}\right]}{f^2}-$$

$$\frac{\sqrt{-b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right]\ \text{Log}\left[\frac{2\left(\sqrt{b}-\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(1-\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right)}\right]}{2\ f^2}-$$

$$\frac{\sqrt{-b}\ d\ \text{ArcTanh}\left[\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right]\ \text{Log}\left[-\frac{2\left(\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(1-\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right)}\right]}{2\ f^2}-$$

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

$$\frac{\sqrt{b}\ d\ \text{PolyLog}\left[2,\ 1-\frac{2\sqrt{b}}{\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}}\right]}{2\ f^2}+\frac{\sqrt{b}\ d\ \text{PolyLog}\left[2,\ 1-\frac{2\sqrt{b}\left(\sqrt{-b}-\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}\right]}{4\ f^2}+$$

$$\frac{\sqrt{b}\ d\ \text{PolyLog}\left[2,\ 1-\frac{2\sqrt{b}\left(\sqrt{-b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}\right]}{4\ f^2}+$$

$$\frac{\sqrt{-b}\ d\ \text{PolyLog}\left[2,\ 1-\frac{2}{1-\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}}\right]}{2\ f^2}-\frac{\sqrt{-b}\ d\ \text{PolyLog}\left[2,\ 1-\frac{2\left(\sqrt{b}-\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(1-\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right)}\right]}{4\ f^2}-$$

$$\frac{\sqrt{-b}\ d\ \text{PolyLog}\left[2,\ 1+\frac{2\left(\sqrt{b}+\sqrt{b\ \text{Tanh}[e+f\ x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(1-\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}\right)}\right]}{4\ f^2}+\frac{\sqrt{-b}\ d\ \text{PolyLog}\left[2,\ 1-\frac{2}{1+\frac{\sqrt{b\ \text{Tanh}[e+f\ x]}}{\sqrt{-b}}}\right]}{2\ f^2}$$

Result (type 4, 556 leaves):

$$\frac{1}{8\ f^2\ \sqrt{\text{Tanh}[e+f\ x]}}$$
$$\Big(-4\ f\ (c+d\ x)\ \Big(2\ \text{ArcTan}\big[\sqrt{\text{Tanh}[e+f\ x]}\big]+\text{Log}\big[1-\sqrt{\text{Tanh}[e+f\ x]}\big]-\text{Log}\big[1+\sqrt{\text{Tanh}[e+f\ x]}\big]\Big)+$$
$$d\ \Big(4\ i\ \text{ArcTan}\big[\sqrt{\text{Tanh}[e+f\ x]}\big]^2-$$
$$4\ \text{ArcTan}\big[\sqrt{\text{Tanh}[e+f\ x]}\big]\ \text{Log}\big[1+e^{4\ i\ \text{ArcTan}[\sqrt{\text{Tanh}[e+f\ x]}]}\big]-\text{Log}\big[1-\sqrt{\text{Tanh}[e+f\ x]}\big]^2+$$
$$2\ \text{Log}\big[1-\sqrt{\text{Tanh}[e+f\ x]}\big]\ \text{Log}\Big[\Big(\frac{1}{2}+\frac{i}{2}\Big)\ \Big(-i+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]+$$
$$2\ \text{Log}\big[1-\sqrt{\text{Tanh}[e+f\ x]}\big]\ \text{Log}\Big[\Big(\frac{1}{2}-\frac{i}{2}\Big)\ \Big(i+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]-$$
$$2\ \text{Log}\big[1-\sqrt{\text{Tanh}[e+f\ x]}\big]\ \text{Log}\Big[\frac{1}{2}\ \Big(1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]-$$
$$2\ \text{Log}\Big[1-\Big(\frac{1}{2}-\frac{i}{2}\Big)\ \Big(1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]\ \text{Log}\big[1+\sqrt{\text{Tanh}[e+f\ x]}\big]+$$
$$2\ \text{Log}\Big[\frac{1}{2}\ \Big(1-\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]\ \text{Log}\big[1+\sqrt{\text{Tanh}[e+f\ x]}\big]-$$
$$2\ \text{Log}\Big[\Big(-\frac{1}{2}-\frac{i}{2}\Big)\ \Big(i+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]\ \text{Log}\big[1+\sqrt{\text{Tanh}[e+f\ x]}\big]+$$
$$\text{Log}\big[1+\sqrt{\text{Tanh}[e+f\ x]}\big]^2+i\ \text{PolyLog}\big[2,\ -e^{4\ i\ \text{ArcTan}[\sqrt{\text{Tanh}[e+f\ x]}]}\big]-$$
$$2\ \text{PolyLog}\Big[2,\ \frac{1}{2}\ \Big(1-\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]+2\ \text{PolyLog}\Big[2,\ \Big(-\frac{1}{2}-\frac{i}{2}\Big)\ \Big(-1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]+$$
$$2\ \text{PolyLog}\Big[2,\ \Big(-\frac{1}{2}+\frac{i}{2}\Big)\ \Big(-1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]+$$
$$2\ \text{PolyLog}\Big[2,\ \frac{1}{2}\ \Big(1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]-2\ \text{PolyLog}\Big[2,\ \Big(\frac{1}{2}-\frac{i}{2}\Big)\ \Big(1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]-$$
$$2\ \text{PolyLog}\Big[2,\ \Big(\frac{1}{2}+\frac{i}{2}\Big)\ \Big(1+\sqrt{\text{Tanh}[e+f\ x]}\Big)\Big]\Big)\Big)\ \sqrt{b\ \text{Tanh}[e+f\ x]}$$

Problem 19: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{c+d\ x}{\sqrt{b\ \text{Tanh}[e+f\ x]}}\ dx$$

Optimal (type 4, 1280 leaves, 37 steps):

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

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

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{b}}\right]\text{Log}\left[\frac{2\sqrt{b}}{\sqrt{b}-\sqrt{b\,\text{Tanh}[e+f\,x]}}\right]}{\sqrt{b}\,f^2}+\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{b}}\right]\text{Log}\left[\frac{2\sqrt{b}}{\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}}\right]}{\sqrt{b}\,f^2}-$$

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{b}}\right]\text{Log}\left[\frac{2\sqrt{b}\left(\sqrt{-b}-\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}\right]}{2\sqrt{b}\,f^2}-$$

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{b}}\right]\text{Log}\left[\frac{2\sqrt{b}\left(\sqrt{-b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}\right]}{2\sqrt{b}\,f^2}+$$

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right]\text{Log}\left[\frac{2}{1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}}\right]}{\sqrt{-b}\,f^2}-$$

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right]\text{Log}\left[\frac{2\left(\sqrt{b}-\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right)}\right]}{2\sqrt{-b}\,f^2}-$$

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right]\text{Log}\left[-\frac{2\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right)}\right]}{2\sqrt{-b}\,f^2}-$$

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

$$\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2\sqrt{b}}{\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}}\right]}{2\sqrt{b}\,f^2}+\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2\sqrt{b}\left(\sqrt{-b}-\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}\right]}{4\sqrt{b}\,f^2}+$$

$$\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2\sqrt{b}\left(\sqrt{-b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}\right]}{4\sqrt{b}\,f^2}+$$

$$\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2}{1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}}\right]}{2\sqrt{-b}\,f^2}-\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2\left(\sqrt{b}-\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right)}\right]}{4\sqrt{-b}\,f^2}-$$

$$\frac{d\,\text{PolyLog}\left[2,\,1+\frac{2\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right)}\right]}{4\sqrt{-b}\,f^2}+\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2}{1+\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}}\right]}{2\sqrt{-b}\,f^2}$$

Result (type 4, 556 leaves):

$$\frac{1}{8\,f^2\sqrt{b\,\text{Tanh}[e+f\,x]}}$$

$$\Big(4\,f\,(c+d\,x)\left(2\,\text{ArcTan}\left[\sqrt{\text{Tanh}[e+f\,x]}\right]-\text{Log}\left[1-\sqrt{\text{Tanh}[e+f\,x]}\right]+\text{Log}\left[1+\sqrt{\text{Tanh}[e+f\,x]}\right]\right)+$$

$$d\,\Big(-4\,i\,\text{ArcTan}\left[\sqrt{\text{Tanh}[e+f\,x]}\right]^2+$$

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

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

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

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

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

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

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

$$\text{Log}\left[1+\sqrt{\text{Tanh}[e+f\,x]}\right]^2-i\,\text{PolyLog}\left[2,\,-e^{4\,i\,\text{ArcTan}\left[\sqrt{\text{Tanh}[e+f\,x]}\right]}\right]-$$

$$2\,\text{PolyLog}\left[2,\,\frac{1}{2}\left(1-\sqrt{\text{Tanh}[e+f\,x]}\right)\right]+2\,\text{PolyLog}\left[2,\,\left(-\frac{1}{2}-\frac{i}{2}\right)\left(-1+\sqrt{\text{Tanh}[e+f\,x]}\right)\right]+$$

$$2\,\text{PolyLog}\left[2,\,\left(-\frac{1}{2}+\frac{i}{2}\right)\left(-1+\sqrt{\text{Tanh}[e+f\,x]}\right)\right]+$$

$$2\,\text{PolyLog}\left[2,\,\frac{1}{2}\left(1+\sqrt{\text{Tanh}[e+f\,x]}\right)\right]-2\,\text{PolyLog}\left[2,\,\left(\frac{1}{2}-\frac{i}{2}\right)\left(1+\sqrt{\text{Tanh}[e+f\,x]}\right)\right]-$$

$$2\,\text{PolyLog}\left[2,\,\left(\frac{1}{2}+\frac{i}{2}\right)\left(1+\sqrt{\text{Tanh}[e+f\,x]}\right)\right]\Big)\Big)\sqrt{\text{Tanh}[e+f\,x]}$$

Problem 20: Unable to integrate problem.

$$\int\frac{c+d\,x}{(b\,\text{Tanh}[e+f\,x])^{3/2}}\,dx$$

Optimal (type 4, 1365 leaves, 43 steps):

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

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

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b \text{Tanh}[e+f x]}}\right]}{b^{3/2} f^2}+\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b \text{Tanh}[e+f x]}}\right]}{b^{3/2} f^2}-$$

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b \text{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \text{Tanh}[e+f x]}\right)}\right]}{2 b^{3/2} f^2}-$$

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{b}}\right] \text{Log}\left[\frac{2 \sqrt{b} \left(\sqrt{-b}+\sqrt{b \text{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \text{Tanh}[e+f x]}\right)}\right]}{2 b^{3/2} f^2}+$$

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}\right] \text{Log}\left[\frac{2}{1-\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}}\right]}{(-b)^{3/2} f^2}-$$

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}\right] \text{Log}\left[\frac{2 \left(\sqrt{b}-\sqrt{b \text{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right) \left(1-\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}\right)}\right]}{2 (-b)^{3/2} f^2}-$$

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}\right] \text{Log}\left[-\frac{2 \left(\sqrt{b}+\sqrt{b \text{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(1-\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}\right)}\right]}{2 (-b)^{3/2} f^2}-$$

$$\frac{d \text{ArcTanh}\left[\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}\right] \text{Log}\left[\frac{2}{1+\frac{\sqrt{b \text{Tanh}[e+f x]}}{\sqrt{-b}}}\right]}{(-b)^{3/2} f^2}-\frac{d \text{PolyLog}\left[2,1-\frac{2 \sqrt{b}}{\sqrt{b}-\sqrt{b \text{Tanh}[e+f x]}}\right]}{2 b^{3/2} f^2}-$$

$$\frac{d \text{PolyLog}\left[2,1-\frac{2 \sqrt{b}}{\sqrt{b}+\sqrt{b \text{Tanh}[e+f x]}}\right]}{2 b^{3/2} f^2}+\frac{d \text{PolyLog}\left[2,1-\frac{2 \sqrt{b} \left(\sqrt{-b}-\sqrt{b \text{Tanh}[e+f x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right) \left(\sqrt{b}+\sqrt{b \text{Tanh}[e+f x]}\right)}\right]}{4 b^{3/2} f^2}+$$

$$\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2\sqrt{b}\left(\sqrt{-b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}\right]}{4\,b^{3/2}\,f^2}+\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2}{1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}}\right]}{2\,(-b)^{3/2}\,f^2}-$$

$$\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2\left(\sqrt{b}-\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}+\sqrt{b}\right)\left(1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right)}\right]}{4\,(-b)^{3/2}\,f^2}-\frac{d\,\text{PolyLog}\left[2,\,1+\frac{2\left(\sqrt{b}+\sqrt{b\,\text{Tanh}[e+f\,x]}\right)}{\left(\sqrt{-b}-\sqrt{b}\right)\left(1-\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}\right)}\right]}{4\,(-b)^{3/2}\,f^2}+$$

$$\frac{d\,\text{PolyLog}\left[2,\,1-\frac{2}{1+\frac{\sqrt{b\,\text{Tanh}[e+f\,x]}}{\sqrt{-b}}}\right]}{2\,(-b)^{3/2}\,f^2}-\frac{2\,(c+d\,x)}{b\,f\,\sqrt{b\,\text{Tanh}[e+f\,x]}}$$

Result (type 8, 20 leaves):

$$\int\frac{c+d\,x}{\left(b\,\text{Tanh}[e+f\,x]\right)^{3/2}}\,dx$$

Problem 22: Attempted integration timed out after 120 seconds.

$$\int(c+d\,x)^2\,\sqrt{b\,\text{Tanh}[e+f\,x]}\,dx$$

Optimal (type 8, 23 leaves, 0 steps):

$$\text{Int}\left[(c+d\,x)^2\,\sqrt{b\,\text{Tanh}[e+f\,x]},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 23: Attempted integration timed out after 120 seconds.

$$\int\frac{(c+d\,x)^2}{\sqrt{b\,\text{Tanh}[e+f\,x]}}\,dx$$

Optimal (type 8, 23 leaves, 0 steps):

$$\text{Int}\left[\frac{(c+d\,x)^2}{\sqrt{b\,\text{Tanh}[e+f\,x]}},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 50: Result more than twice size of optimal antiderivative.

$$\int\frac{(c+d\,x)^m}{a+a\,\text{Tanh}[e+f\,x]}\,dx$$

Optimal (type 4, 89 leaves, 2 steps):

$$\frac{(c+d\,x)^{1+m}}{2\,a\,d\,(1+m)}-\frac{2^{-2-m}\,e^{-2\,e+\frac{2\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{2\,f\,(c+d\,x)}{d}\right]}{a\,f}$$

Result (type 4, 186 leaves):

$$\left(2^{-2-m}\,(c+d\,x)^m\left(-\frac{f\,(c+d\,x)}{d}\right)^m\left(-\frac{f^2\,(c+d\,x)^2}{d^2}\right)^{-m}\text{Sech}[e+f\,x]\left(d\,(1+m)\,\text{Gamma}\left[1+m,\frac{2\,f\,(c+d\,x)}{d}\right]\left(-\text{Cosh}\left[e-\frac{c\,f}{d}\right]+\text{Sinh}\left[e-\frac{c\,f}{d}\right]\right)+2^{1+m}\,f\left(f\left(\frac{c}{d}+x\right)\right)^m(c+d\,x)\left(\text{Cosh}\left[e-\frac{c\,f}{d}\right]+\text{Sinh}\left[e-\frac{c\,f}{d}\right]\right)\right)\left(\text{Cosh}\left[f\left(\frac{c}{d}+x\right)\right]+\text{Sinh}\left[f\left(\frac{c}{d}+x\right)\right]\right)\right)\Big/\left(a\,d\,f\,(1+m)\,(1+\text{Tanh}[e+f\,x])\right)$$

Problem 51: Attempted integration timed out after 120 seconds.

$$\int\frac{(c+d\,x)^m}{(a+a\,\text{Tanh}[e+f\,x])^2}\,dx$$

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

$$\frac{(c+d\,x)^{1+m}}{4\,a^2\,d\,(1+m)}-\frac{2^{-2-m}\,e^{-2\,e+\frac{2\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{2\,f\,(c+d\,x)}{d}\right]}{a^2\,f}-\frac{4^{-2-m}\,e^{-4\,e+\frac{4\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{4\,f\,(c+d\,x)}{d}\right]}{a^2\,f}$$

Result (type 1, 1 leaves):

???

Problem 52: Attempted integration timed out after 120 seconds.

$$\int\frac{(c+d\,x)^m}{(a+a\,\text{Tanh}[e+f\,x])^3}\,dx$$

Optimal (type 4, 224 leaves, 5 steps):

$$\frac{(c+d\,x)^{1+m}}{8\,a^3\,d\,(1+m)}-\frac{3\times 2^{-4-m}\,e^{-2\,e+\frac{2\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{2\,f\,(c+d\,x)}{d}\right]}{a^3\,f}-$$
$$\frac{3\times 2^{-5-2\,m}\,e^{-4\,e+\frac{4\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{4\,f\,(c+d\,x)}{d}\right]}{a^3\,f}-$$
$$\frac{2^{-4-m}\times 3^{-1-m}\,e^{-6\,e+\frac{6\,c\,f}{d}}\,(c+d\,x)^m\left(\frac{f\,(c+d\,x)}{d}\right)^{-m}\text{Gamma}\left[1+m,\frac{6\,f\,(c+d\,x)}{d}\right]}{a^3\,f}$$

Result (type 1, 1 leaves):

???

Problem 55: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c+d\,x)\,(a+b\,\text{Tanh}[e+f\,x])\,dx$$

Optimal (type 4, 75 leaves, 6 steps):

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

Result (type 4, 227 leaves):

$$a\,c\,x+\frac{1}{2}\,a\,d\,x^2+\frac{b\,c\,\text{Log}[\text{Cosh}[e+f\,x]]}{f}-\Bigg(b\,d\,\text{Csch}[e]\Bigg(-e^{-\text{ArcTanh}[\text{Coth}[e]]}\,f^2\,x^2+\frac{1}{\sqrt{1-\text{Coth}[e]^2}}\,i\,\text{Coth}[e]$$
$$\Big(-f\,x\,(-\pi+2\,i\,\text{ArcTanh}[\text{Coth}[e]])-\pi\,\text{Log}\left[1+e^{2\,f\,x}\right]-2\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])$$
$$\text{Log}\left[1-e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]+\pi\,\text{Log}[\text{Cosh}[f\,x]]+2\,i\,\text{ArcTanh}[\text{Coth}[e]]$$
$$\text{Log}[i\,\text{Sinh}[f\,x+\text{ArcTanh}[\text{Coth}[e]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(i\,f\,x+i\,\text{ArcTanh}[\text{Coth}[e]])}\right]\Big)\Bigg)$$
$$\text{Sech}[e]\Bigg)\Big/\left(2\,f^2\,\sqrt{\text{Csch}[e]^2\,(-\text{Cosh}[e]^2+\text{Sinh}[e]^2)}\right)+\frac{1}{2}\,b\,d\,x^2\,\text{Tanh}[e]$$

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

$$\int (c+d\,x)^3\,(a+b\,\text{Tanh}[e+f\,x])^2\,dx$$

Optimal (type 4, 277 leaves, 15 steps):

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

Result (type 4, 1062 leaves):

$$\frac{1}{2 (1+e^{2 e}) f} b e^{2 e} \Big(-12 b c^2 d x-8 a c^3 f x-12 b c d^2 x^2-12 a c^2 d f x^2-4 b d^3 x^3-8 a c d^2 f x^3-2 a d^3 f x^4+4 a c^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+4 a c^3 e^{-2 e} \text{Log}\left[1+e^{2 (e+f x)}\right]+\frac{6 b c^2 d \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+\frac{6 b c^2 d e^{-2 e} \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+12 a c^2 d x \text{Log}\left[1+e^{2 (e+f x)}\right]+12 a c^2 d e^{-2 e} x \text{Log}\left[1+e^{2 (e+f x)}\right]+\frac{12 b c d^2 x \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+\frac{12 b c d^2 e^{-2 e} x \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+12 a c d^2 x^2 \text{Log}\left[1+e^{2 (e+f x)}\right]+12 a c d^2 e^{-2 e} x^2 \text{Log}\left[1+e^{2 (e+f x)}\right]+\frac{6 b d^3 x^2 \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+\frac{6 b d^3 e^{-2 e} x^2 \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+4 a d^3 x^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+4 a d^3 e^{-2 e} x^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+\frac{1}{f^2} 6 d e^{-2 e} (1+e^{2 e}) (c+d x) (b d+a f (c+d x)) \text{PolyLog}\left[2,-e^{2 (e+f x)}\right]-\frac{3 d^2 e^{-2 e} (1+e^{2 e}) (b d+2 a f (c+d x)) \text{PolyLog}\left[3,-e^{2 (e+f x)}\right]}{f^3}+\frac{3 a d^3 \text{PolyLog}\left[4,-e^{2 (e+f x)}\right]}{f^3}+\frac{3 a d^3 e^{-2 e} \text{PolyLog}\left[4,-e^{2 (e+f x)}\right]}{f^3}\Big)+\frac{1}{8 f} \text{Sech}[e] \text{Sech}[e+f x] \big(4 a^2 c^3 f x \text{Cosh}[f x]+4 b^2 c^3 f x \text{Cosh}[f x]+6 a^2 c^2 d f x^2 \text{Cosh}[f x]+6 b^2 c^2 d f x^2 \text{Cosh}[f x]+4 a^2 c d^2 f x^3 \text{Cosh}[f x]+4 b^2 c d^2 f x^3 \text{Cosh}[f x]+a^2 d^3 f x^4 \text{Cosh}[f x]+b^2 d^3 f x^4 \text{Cosh}[f x]+4 a^2 c^3 f x \text{Cosh}[2 e+f x]+4 b^2 c^3 f x \text{Cosh}[2 e+f x]+6 a^2 c^2 d f x^2 \text{Cosh}[2 e+f x]+6 b^2 c^2 d f x^2 \text{Cosh}[2 e+f x]+4 a^2 c d^2 f x^3 \text{Cosh}[2 e+f x]+4 b^2 c d^2 f x^3 \text{Cosh}[2 e+f x]+a^2 d^3 f x^4 \text{Cosh}[2 e+f x]+b^2 d^3 f x^4 \text{Cosh}[2 e+f x]-8 b^2 c^3 \text{Sinh}[f x]-24 b^2 c^2 d x \text{Sinh}[f x]-8 a b c^3 f x \text{Sinh}[f x]-24 b^2 c d^2 x^2 \text{Sinh}[f x]-12 a b c^2 d f x^2 \text{Sinh}[f x]-8 b^2 d^3 x^3 \text{Sinh}[f x]-8 a b c d^2 f x^3 \text{Sinh}[f x]-2 a b d^3 f x^4 \text{Sinh}[f x]+8 a b c^3 f x \text{Sinh}[2 e+f x]+12 a b c^2 d f x^2 \text{Sinh}[2 e+f x]+8 a b c d^2 f x^3 \text{Sinh}[2 e+f x]+2 a b d^3 f x^4 \text{Sinh}[2 e+f x]\big)$$

Problem 63: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^3 (a+b \operatorname{Tanh}[e+f x])^3 \, dx$$

Optimal (type 4, 566 leaves, 28 steps):

$$-\frac{3 b^3 d (c+d x)^2}{2 f^2}-\frac{3 a b^2 (c+d x)^3}{f}+\frac{b^3 (c+d x)^3}{2 f}+\frac{a^3 (c+d x)^4}{4 d}-\frac{3 a^2 b (c+d x)^4}{4 d}+\frac{3 a b^2 (c+d x)^4}{4 d}-\frac{b^3 (c+d x)^4}{4 d}+\frac{3 b^3 d^2 (c+d x) \operatorname{Log}[1+e^{2 (e+f x)}]}{f^3}+\frac{9 a b^2 d (c+d x)^2 \operatorname{Log}[1+e^{2 (e+f x)}]}{f^2}+\frac{3 a^2 b (c+d x)^3 \operatorname{Log}[1+e^{2 (e+f x)}]}{f}+\frac{b^3 (c+d x)^3 \operatorname{Log}[1+e^{2 (e+f x)}]}{f}+\frac{3 b^3 d^3 \operatorname{PolyLog}[2,-e^{2 (e+f x)}]}{2 f^4}+\frac{9 a b^2 d^2 (c+d x) \operatorname{PolyLog}[2,-e^{2 (e+f x)}]}{f^3}+\frac{9 a^2 b d (c+d x)^2 \operatorname{PolyLog}[2,-e^{2 (e+f x)}]}{2 f^2}+\frac{3 b^3 d (c+d x)^2 \operatorname{PolyLog}[2,-e^{2 (e+f x)}]}{2 f^2}-\frac{9 a b^2 d^3 \operatorname{PolyLog}[3,-e^{2 (e+f x)}]}{2 f^4}-\frac{9 a^2 b d^2 (c+d x) \operatorname{PolyLog}[3,-e^{2 (e+f x)}]}{2 f^3}-\frac{3 b^3 d^2 (c+d x) \operatorname{PolyLog}[3,-e^{2 (e+f x)}]}{2 f^3}+\frac{9 a^2 b d^3 \operatorname{PolyLog}[4,-e^{2 (e+f x)}]}{4 f^4}+\frac{3 b^3 d^3 \operatorname{PolyLog}[4,-e^{2 (e+f x)}]}{4 f^4}-\frac{3 b^3 d (c+d x)^2 \operatorname{Tanh}[e+f x]}{2 f^2}-\frac{3 a b^2 (c+d x)^3 \operatorname{Tanh}[e+f x]}{f}-\frac{b^3 (c+d x)^3 \operatorname{Tanh}[e+f x]^2}{2 f}$$

Result (type 4, 2010 leaves):

$$\frac{1}{4 (1+e^{2 e}) f^2} b e^{2 e} \Big(-24 b^2 c d^2 x-72 a b c^2 d f x-24 a^2 c^3 f^2 x-8 b^2 c^3 f^2 x-12 b^2 d^3 x^2-72 a b c d^2 f x^2-36 a^2 c^2 d f^2 x^2-12 b^2 c^2 d f^2 x^2-24 a b d^3 f x^3-24 a^2 c d^2 f^2 x^3-8 b^2 c d^2 f^2 x^3-6 a^2 d^3 f^2 x^4-2 b^2 d^3 f^2 x^4+36 a b c^2 d \operatorname{Log}[1+e^{2 (e+f x)}]+36 a b c^2 d e^{-2 e} \operatorname{Log}[1+e^{2 (e+f x)}]+\frac{12 b^2 c d^2 \operatorname{Log}[1+e^{2 (e+f x)}]}{f}+\frac{12 b^2 c d^2 e^{-2 e} \operatorname{Log}[1+e^{2 (e+f x)}]}{f}+12 a^2 c^3 f \operatorname{Log}[1+e^{2 (e+f x)}]+4 b^2 c^3 f \operatorname{Log}[1+e^{2 (e+f x)}]+12 a^2 c^3 e^{-2 e} f \operatorname{Log}[1+e^{2 (e+f x)}]+4 b^2 c^3 e^{-2 e} f \operatorname{Log}[1+e^{2 (e+f x)}]+72 a b c d^2 x \operatorname{Log}[1+e^{2 (e+f x)}]+72 a b c d^2 e^{-2 e} x \operatorname{Log}[1+e^{2 (e+f x)}]+\frac{12 b^2 d^3 x \operatorname{Log}[1+e^{2 (e+f x)}]}{f}+\frac{12 b^2 d^3 e^{-2 e} x \operatorname{Log}[1+e^{2 (e+f x)}]}{f}+36 a^2 c^2 d f x \operatorname{Log}[1+e^{2 (e+f x)}]+12 b^2 c^2 d f x \operatorname{Log}[1+e^{2 (e+f x)}]+36 a^2 c^2 d e^{-2 e} f x \operatorname{Log}[1+e^{2 (e+f x)}]+12 b^2 c^2 d e^{-2 e} f x \operatorname{Log}[1+e^{2 (e+f x)}]+36 a b d^3 x^2 \operatorname{Log}[1+e^{2 (e+f x)}]+36 a b d^3 e^{-2 e} x^2 \operatorname{Log}[1+e^{2 (e+f x)}]+36 a^2 c d^2 f x^2 \operatorname{Log}[1+e^{2 (e+f x)}]+12 b^2 c d^2 f x^2 \operatorname{Log}[1+e^{2 (e+f x)}]+36 a^2 c d^2 e^{-2 e} f x^2 \operatorname{Log}[1+e^{2 (e+f x)}]+12 b^2 c d^2 e^{-2 e} f x^2 \operatorname{Log}[1+e^{2 (e+f x)}]+$$

$$12 a^2 d^3 f x^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+4 b^2 d^3 f x^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+$$
$$12 a^2 d^3 e^{-2 e} f x^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+4 b^2 d^3 e^{-2 e} f x^3 \text{Log}\left[1+e^{2 (e+f x)}\right]+\frac{1}{f^2}$$
$$6 d e^{-2 e}\left(1+e^{2 e}\right)\left(6 a b d f (c+d x)+3 a^2 f^2 (c+d x)^2+b^2\left(d^2+c^2 f^2+2 c d f^2 x+d^2 f^2 x^2\right)\right)$$
$$\text{PolyLog}\left[2,-e^{2 (e+f x)}\right]-\frac{1}{f^2} 6 d^2 e^{-2 e}\left(1+e^{2 e}\right)\left(3 a b d+3 a^2 f (c+d x)+b^2 f (c+d x)\right)$$
$$\text{PolyLog}\left[3,-e^{2 (e+f x)}\right]+\frac{9 a^2 d^3 \text{PolyLog}\left[4,-e^{2 (e+f x)}\right]}{f^2}+\frac{3 b^2 d^3 \text{PolyLog}\left[4,-e^{2 (e+f x)}\right]}{f^2}+$$
$$\left.\frac{9 a^2 d^3 e^{-2 e} \text{PolyLog}\left[4,-e^{2 (e+f x)}\right]}{f^2}+\frac{3 b^2 d^3 e^{-2 e} \text{PolyLog}\left[4,-e^{2 (e+f x)}\right]}{f^2}\right)+$$
$$\frac{\left(b^3 c^3+3 b^3 c^2 d x+3 b^3 c d^2 x^2+b^3 d^3 x^3\right) \text{Sech}[e+f x]^2}{2 f}+$$
$$\left(3 x^2\left(a^3 c^2 d-3 a^2 b c^2 d+3 a b^2 c^2 d-b^3 c^2 d+a^3 c^2 d \text{Cosh}[2 e]+3 a^2 b c^2 d \text{Cosh}[2 e]+\right.\right.$$
$$3 a b^2 c^2 d \text{Cosh}[2 e]+b^3 c^2 d \text{Cosh}[2 e]+a^3 c^2 d \text{Sinh}[2 e]+3 a^2 b c^2 d \text{Sinh}[2 e]+$$
$$\left.\left.3 a b^2 c^2 d \text{Sinh}[2 e]+b^3 c^2 d \text{Sinh}[2 e]\right)\right) / (2 (1+\text{Cosh}[2 e]+\text{Sinh}[2 e]))+$$
$$\left(x^3\left(a^3 c d^2-3 a^2 b c d^2+3 a b^2 c d^2-b^3 c d^2+a^3 c d^2 \text{Cosh}[2 e]+3 a^2 b c d^2 \text{Cosh}[2 e]+\right.\right.$$
$$3 a b^2 c d^2 \text{Cosh}[2 e]+b^3 c d^2 \text{Cosh}[2 e]+a^3 c d^2 \text{Sinh}[2 e]+3 a^2 b c d^2 \text{Sinh}[2 e]+$$
$$\left.\left.3 a b^2 c d^2 \text{Sinh}[2 e]+b^3 c d^2 \text{Sinh}[2 e]\right)\right) / (1+\text{Cosh}[2 e]+\text{Sinh}[2 e])+$$
$$\left(x^4\left(a^3 d^3-3 a^2 b d^3+3 a b^2 d^3-b^3 d^3+a^3 d^3 \text{Cosh}[2 e]+3 a^2 b d^3 \text{Cosh}[2 e]+3 a b^2 d^3 \text{Cosh}[2 e]+\right.\right.$$
$$\left.\left.b^3 d^3 \text{Cosh}[2 e]+a^3 d^3 \text{Sinh}[2 e]+3 a^2 b d^3 \text{Sinh}[2 e]+3 a b^2 d^3 \text{Sinh}[2 e]+b^3 d^3 \text{Sinh}[2 e]\right)\right) /$$
$$(4 (1+\text{Cosh}[2 e]+\text{Sinh}[2 e]))+x\left(a^3 c^3+3 a b^2 c^3-\frac{3 a^2 b c^3}{1+\text{Cosh}[2 e]+\text{Sinh}[2 e]}+\right.$$
$$\frac{3 a^2 b c^3 \text{Cosh}[2 e]+3 a^2 b c^3 \text{Sinh}[2 e]}{1+\text{Cosh}[2 e]+\text{Sinh}[2 e]}+\left(2 b^3 c^3 \text{Cosh}[2 e]+2 b^3 c^3 \text{Sinh}[2 e]\right) /$$
$$((1+\text{Cosh}[2 e]+\text{Sinh}[2 e])(1-\text{Cosh}[2 e]+\text{Cosh}[4 e]-\text{Sinh}[2 e]+\text{Sinh}[4 e]))+$$
$$\left(-2 b^3 c^3 \text{Cosh}[4 e]-2 b^3 c^3 \text{Sinh}[4 e]\right) /$$
$$((1+\text{Cosh}[2 e]+\text{Sinh}[2 e])(1-\text{Cosh}[2 e]+\text{Cosh}[4 e]-\text{Sinh}[2 e]+\text{Sinh}[4 e]))-$$
$$\left.\frac{b^3 c^3}{1+\text{Cosh}[6 e]+\text{Sinh}[6 e]}+\frac{b^3 c^3 \text{Cosh}[6 e]+b^3 c^3 \text{Sinh}[6 e]}{1+\text{Cosh}[6 e]+\text{Sinh}[6 e]}\right)-\frac{1}{2 f^2}$$
$$3 \text{Sech}[e] \text{Sech}[e+f x]\left(b^3 c^2 d \text{Sinh}[f x]+2 a b^2 c^3 f \text{Sinh}[f x]+2 b^3 c d^2 x \text{Sinh}[f x]+\right.$$
$$\left.6 a b^2 c^2 d f x \text{Sinh}[f x]+b^3 d^3 x^2 \text{Sinh}[f x]+6 a b^2 c d^2 f x^2 \text{Sinh}[f x]+2 a b^2 d^3 f x^3 \text{Sinh}[f x]\right)$$

Problem 64: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^2 (a+b \text{Tanh}[e+f x])^3 \, dx$$

Optimal (type 4, 405 leaves, 22 steps):

$$\frac{b^3 c d x}{f}+\frac{b^3 d^2 x^2}{2 f}-\frac{3 a b^2 (c+d x)^2}{f}+\frac{a^3 (c+d x)^3}{3 d}-\frac{a^2 b (c+d x)^3}{d}+\frac{a b^2 (c+d x)^3}{d}-\frac{b^3 (c+d x)^3}{3 d}+\frac{6 a b^2 d (c+d x) \text{Log}\left[1+e^{2 (e+f x)}\right]}{f^2}+\frac{3 a^2 b (c+d x)^2 \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+\frac{b^3 (c+d x)^2 \text{Log}\left[1+e^{2 (e+f x)}\right]}{f}+\frac{b^3 d^2 \text{Log}[\text{Cosh}[e+f x]]}{f^3}+\frac{3 a b^2 d^2 \text{PolyLog}\left[2,-e^{2 (e+f x)}\right]}{f^3}+\frac{3 a^2 b d (c+d x) \text{PolyLog}\left[2,-e^{2 (e+f x)}\right]}{f^2}+\frac{b^3 d (c+d x) \text{PolyLog}\left[2,-e^{2 (e+f x)}\right]}{f^2}-\frac{3 a^2 b d^2 \text{PolyLog}\left[3,-e^{2 (e+f x)}\right]}{2 f^3}-\frac{b^3 d^2 \text{PolyLog}\left[3,-e^{2 (e+f x)}\right]}{2 f^3}-\frac{b^3 d (c+d x) \text{Tanh}[e+f x]}{f^2}-\frac{3 a b^2 (c+d x)^2 \text{Tanh}[e+f x]}{f}-\frac{b^3 (c+d x)^2 \text{Tanh}[e+f x]^2}{2 f}$$

Result (type 4, 1142 leaves):

$$\frac{1}{6 f^3} b \left(-\frac{1}{1+e^{2 e}} 4 e^{2 e} f x \left(9 a b d f (2 c+d x)+3 a^2 f^2 \left(3 c^2+3 c d x+d^2 x^2\right)+b^2 \left(3 c^2 f^2+3 c d f^2 x+d^2 \left(3+f^2 x^2\right)\right)\right)+6 \left(6 a b d f (c+d x)+3 a^2 f^2 (c+d x)^2+b^2 \left(c^2 f^2+2 c d f^2 x+d^2 \left(1+f^2 x^2\right)\right)\right) \text{Log}\left[1+e^{2 (e+f x)}\right]+6 d \left(3 a b d+3 a^2 f (c+d x)+b^2 f (c+d x)\right) \text{PolyLog}\left[2,-e^{2 (e+f x)}\right]-3 \left(3 a^2+b^2\right) d^2 \text{PolyLog}\left[3,-e^{2 (e+f x)}\right]\right)+$$

$$\frac{1}{12 f^2} \text{Sech}[e] \text{Sech}[e+f x]^2 \left(6 b^3 c^2 f \text{Cosh}[e]+12 b^3 c d f x \text{Cosh}[e]+6 a^3 c^2 f^2 x \text{Cosh}[e]+18 a b^2 c^2 f^2 x \text{Cosh}[e]+6 b^3 d^2 f x^2 \text{Cosh}[e]+6 a^3 c d f^2 x^2 \text{Cosh}[e]+18 a b^2 c d f^2 x^2 \text{Cosh}[e]+2 a^3 d^2 f^2 x^3 \text{Cosh}[e]+6 a b^2 d^2 f^2 x^3 \text{Cosh}[e]+3 a^3 c^2 f^2 x \text{Cosh}[e+2 f x]+9 a b^2 c^2 f^2 x \text{Cosh}[e+2 f x]+3 a^3 c d f^2 x^2 \text{Cosh}[e+2 f x]+9 a b^2 c d f^2 x^2 \text{Cosh}[e+2 f x]+a^3 d^2 f^2 x^3 \text{Cosh}[e+2 f x]+3 a b^2 d^2 f^2 x^3 \text{Cosh}[e+2 f x]+3 a^3 c^2 f^2 x \text{Cosh}[3 e+2 f x]+9 a b^2 c^2 f^2 x \text{Cosh}[3 e+2 f x]+3 a^3 c d f^2 x^2 \text{Cosh}[3 e+2 f x]+9 a b^2 c d f^2 x^2 \text{Cosh}[3 e+2 f x]+a^3 d^2 f^2 x^3 \text{Cosh}[3 e+2 f x]+3 a b^2 d^2 f^2 x^3 \text{Cosh}[3 e+2 f x]+6 b^3 c d \text{Sinh}[e]+18 a b^2 c^2 f \text{Sinh}[e]+6 b^3 d^2 x \text{Sinh}[e]+36 a b^2 c d f x \text{Sinh}[e]+18 a^2 b c^2 f^2 x \text{Sinh}[e]+6 b^3 c^2 f^2 x \text{Sinh}[e]+18 a b^2 d^2 f x^2 \text{Sinh}[e]+18 a^2 b c d f^2 x^2 \text{Sinh}[e]+6 b^3 c d f^2 x^2 \text{Sinh}[e]+6 a^2 b d^2 f^2 x^3 \text{Sinh}[e]+2 b^3 d^2 f^2 x^3 \text{Sinh}[e]-6 b^3 c d \text{Sinh}[e+2 f x]-18 a b^2 c^2 f \text{Sinh}[e+2 f x]-6 b^3 d^2 x \text{Sinh}[e+2 f x]-36 a b^2 c d f x \text{Sinh}[e+2 f x]-9 a^2 b c^2 f^2 x \text{Sinh}[e+2 f x]-3 b^3 c^2 f^2 x \text{Sinh}[e+2 f x]-18 a b^2 d^2 f x^2 \text{Sinh}[e+2 f x]-9 a^2 b c d f^2 x^2 \text{Sinh}[e+2 f x]-3 b^3 c d f^2 x^2 \text{Sinh}[e+2 f x]-3 a^2 b d^2 f^2 x^3 \text{Sinh}[e+2 f x]-b^3 d^2 f^2 x^3 \text{Sinh}[e+2 f x]+9 a^2 b c^2 f^2 x \text{Sinh}[3 e+2 f x]+3 b^3 c^2 f^2 x \text{Sinh}[3 e+2 f x]+9 a^2 b c d f^2 x^2 \text{Sinh}[3 e+2 f x]+3 b^3 c d f^2 x^2 \text{Sinh}[3 e+2 f x]+3 a^2 b d^2 f^2 x^3 \text{Sinh}[3 e+2 f x]+b^3 d^2 f^2 x^3 \text{Sinh}[3 e+2 f x]\right)$$

Problem 73: Result more than twice size of optimal antiderivative.

$$\int \frac{(c+d x)^3}{(a+b \text{Tanh}[e+f x])^2} \, dx$$

Optimal (type 4, 642 leaves, 28 steps):

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

Result (type 4, 2119 leaves):

$$-\frac{1}{2 (a-b)^2 (a+b)^2 \left(b \left(-1+e^{2 e}\right)+a \left(1+e^{2 e}\right)\right) f^4}$$
$$b \Big(12 a b c^2 d e^{2 e} f^3 x+12 b^2 c^2 d e^{2 e} f^3 x-8 a^2 c^3 e^{2 e} f^4 x-8 a b c^3 e^{2 e} f^4 x+12 a b c d^2 e^{2 e} f^3 x^2+$$
$$12 b^2 c d^2 e^{2 e} f^3 x^2-12 a^2 c^2 d e^{2 e} f^4 x^2-12 a b c^2 d e^{2 e} f^4 x^2+4 a b d^3 e^{2 e} f^3 x^3+$$
$$4 b^2 d^3 e^{2 e} f^3 x^3-8 a^2 c d^2 e^{2 e} f^4 x^3-8 a b c d^2 e^{2 e} f^4 x^3-2 a^2 d^3 e^{2 e} f^4 x^4-2 a b d^3 e^{2 e} f^4 x^4-$$
$$12 a b c d^2 f^2 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+12 b^2 c d^2 f^2 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-$$
$$12 a b c d^2 e^{2 e} f^2 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-12 b^2 c d^2 e^{2 e} f^2 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+$$
$$12 a^2 c^2 d f^3 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-12 a b c^2 d f^3 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+$$
$$12 a^2 c^2 d e^{2 e} f^3 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+12 a b c^2 d e^{2 e} f^3 x \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-$$
$$6 a b d^3 f^2 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+6 b^2 d^3 f^2 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-$$
$$6 a b d^3 e^{2 e} f^2 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-6 b^2 d^3 e^{2 e} f^2 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+$$
$$12 a^2 c d^2 f^3 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]-12 a b c d^2 f^3 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+$$
$$12 a^2 c d^2 e^{2 e} f^3 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+12 a b c d^2 e^{2 e} f^3 x^2 \text{Log}\left[1+\frac{(a+b) e^{2 (e+f x)}}{a-b}\right]+$$

$$4 a^2 d^3 f^3 x^3 \text{Log}\left[1+\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]-4 a b d^3 f^3 x^3 \text{Log}\left[1+\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]+$$
$$4 a^2 d^3 e^{2 e} f^3 x^3 \text{Log}\left[1+\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]+4 a b d^3 e^{2 e} f^3 x^3 \text{Log}\left[1+\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]-$$
$$6 a b c^2 d f^2 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]+$$
$$6 b^2 c^2 d f^2 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]-$$
$$6 a b c^2 d e^{2 e} f^2 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]-6 b^2 c^2 d e^{2 e} f^2$$
$$\text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]+4 a^2 c^3 f^3 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]-$$
$$4 a b c^3 f^3 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]+$$
$$4 a^2 c^3 e^{2 e} f^3 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]+$$
$$4 a b c^3 e^{2 e} f^3 \text{Log}\left[b\left(-1+e^{2(e+f x)}\right)+a\left(1+e^{2(e+f x)}\right)\right]+6 d\left(b\left(-1+e^{2 e}\right)+a\left(1+e^{2 e}\right)\right)$$
$$f\,(c+d x)\,(-b d+a f\,(c+d x))\,\text{PolyLog}\left[2,-\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]-$$
$$3 d^2\left(b\left(-1+e^{2 e}\right)+a\left(1+e^{2 e}\right)\right)(-b d+2 a f\,(c+d x))\,\text{PolyLog}\left[3,-\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]+$$
$$3 a^2 d^3 \text{PolyLog}\left[4,-\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]-3 a b d^3 \text{PolyLog}\left[4,-\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]+$$
$$3 a^2 d^3 e^{2 e} \text{PolyLog}\left[4,-\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]+3 a b d^3 e^{2 e} \text{PolyLog}\left[4,-\frac{(a+b)\, e^{2(e+f x)}}{a-b}\right]\Bigg)+$$
$$\big(4 a^2 c^3 f x \text{Cosh}[f x]+4 b^2 c^3 f x \text{Cosh}[f x]+6 a^2 c^2 d f x^2 \text{Cosh}[f x]+$$
$$6 b^2 c^2 d f x^2 \text{Cosh}[f x]+4 a^2 c d^2 f x^3 \text{Cosh}[f x]+$$
$$4 b^2 c d^2 f x^3 \text{Cosh}[f x]+a^2 d^3 f x^4 \text{Cosh}[f x]+b^2 d^3 f x^4 \text{Cosh}[f x]+$$
$$4 a^2 c^3 f x \text{Cosh}[2 e+f x]-4 b^2 c^3 f x \text{Cosh}[2 e+f x]+$$
$$6 a^2 c^2 d f x^2 \text{Cosh}[2 e+f x]-6 b^2 c^2 d f x^2 \text{Cosh}[2 e+f x]+$$
$$4 a^2 c d^2 f x^3 \text{Cosh}[2 e+f x]-4 b^2 c d^2 f x^3 \text{Cosh}[2 e+f x]+$$
$$a^2 d^3 f x^4 \text{Cosh}[2 e+f x]-b^2 d^3 f x^4 \text{Cosh}[2 e+f x]-$$
$$8 b^2 c^3 \text{Sinh}[f x]-24 b^2 c^2 d x \text{Sinh}[f x]+8 a b c^3 f x \text{Sinh}[f x]-$$
$$24 b^2 c d^2 x^2 \text{Sinh}[f x]+12 a b c^2 d f x^2 \text{Sinh}[f x]-$$
$$8 b^2 d^3 x^3 \text{Sinh}[f x]+8 a b c d^2 f x^3 \text{Sinh}[f x]+2 a b d^3 f x^4 \text{Sinh}[f x]\big)\Big/$$
$$\big(8\,(a-b)\,(a+b)\,f\,(a \text{Cosh}[e]+b \text{Sinh}[e])\,(a \text{Cosh}[e+f x]+b \text{Sinh}[e+f x])\big)$$

Problem 75: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 196 leaves, 5 steps):

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

Result (type 4, 751 leaves):

$$\Big((e+f x)\,(-2 d e+2 c f+d\,(e+f x))\,\text{Sech}[e+f x]^2\,(a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x])^2\Big)\Big/$$
$$\Big(2\,(a-b)\,(a+b)\,f^2\,(a+b\,\text{Tanh}[e+f x])^2\Big)+$$
$$\Big(b^2 d\,(-b\,(e+f x)+a\,\text{Log}[a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x]])\,\text{Sech}[e+f x]^2$$
$$(a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x])^2\Big)\Big/\Big(a\,(a-b)\,(a+b)\,(a^2-b^2)\,f^2\,(a+b\,\text{Tanh}[e+f x])^2\Big)+$$
$$\Big(2 b d e\,(-b\,(e+f x)+a\,\text{Log}[a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x]])\,\text{Sech}[e+f x]^2$$
$$(a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x])^2\Big)\Big/\Big((a-b)\,(a+b)\,(a^2-b^2)\,f^2\,(a+b\,\text{Tanh}[e+f x])^2\Big)-$$
$$\Big(2 b c\,(-b\,(e+f x)+a\,\text{Log}[a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x]])\,\text{Sech}[e+f x]^2$$
$$(a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x])^2\Big)\Big/\Big((a-b)\,(a+b)\,(a^2-b^2)\,f\,(a+b\,\text{Tanh}[e+f x])^2\Big)+$$
$$\left(d\left(-e^{-\text{ArcTanh}\left[\frac{a}{b}\right]}\,(e+f x)^2+\frac{1}{\sqrt{1-\frac{a^2}{b^2}}\;b}\,i\,a\,\left(-(e+f x)\,\left(-\pi+2\,i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)-\right.\right.\right.$$
$$\pi\,\text{Log}\left[1+e^{2\,(e+f x)}\right]-2\left(i\,(e+f x)+i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)\text{Log}\left[1-e^{2\,i\,\left(i\,(e+f x)+i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)}\right]+$$
$$\pi\,\text{Log}[\text{Cosh}[e+f x]]+2\,i\,\text{ArcTanh}\left[\frac{a}{b}\right]\text{Log}\left[i\,\text{Sinh}\left[e+f x+\text{ArcTanh}\left[\frac{a}{b}\right]\right]\right]+$$
$$\left.\left.i\,\text{PolyLog}\left[2,\,e^{2\,i\,\left(i\,(e+f x)+i\,\text{ArcTanh}\left[\frac{a}{b}\right]\right)}\right]\right)\right)\text{Sech}[e+f x]^2$$
$$\left.(a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x])^2\right)\Big/\left((a-b)\,(a+b)\,\sqrt{\frac{-a^2+b^2}{b^2}}\;f^2\,(a+b\,\text{Tanh}[e+f x])^2\right)+$$
$$\Big(\text{Sech}[e+f x]^2\,(a\,\text{Cosh}[e+f x]+b\,\text{Sinh}[e+f x])$$
$$(b^2 d e\,\text{Sinh}[e+f x]-b^2 c f\,\text{Sinh}[e+f x]-b^2 d\,(e+f x)\,\text{Sinh}[e+f x])\Big)\Big/$$
$$\Big(a\,(a-b)\,(a+b)\,f^2\,(a+b\,\text{Tanh}[e+f x])^2\Big)$$

Problem 76: Attempted integration timed out after 120 seconds.

$$\int\frac{1}{(c+d x)\,(a+b\,\text{Tanh}[e+f x])^2}\,dx$$

Optimal (type 8, 23 leaves, 0 steps):

$$\text{Int}\left[\frac{1}{(c+d x)\,(a+b\,\text{Tanh}[e+f x])^2},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 77: Attempted integration timed out after 120 seconds.

$$\int \frac{1}{(c+d\,x)^2\,(a+b\,\text{Tanh}[e+f\,x])^2}\,dx$$

Optimal (type 8, 23 leaves, 0 steps):

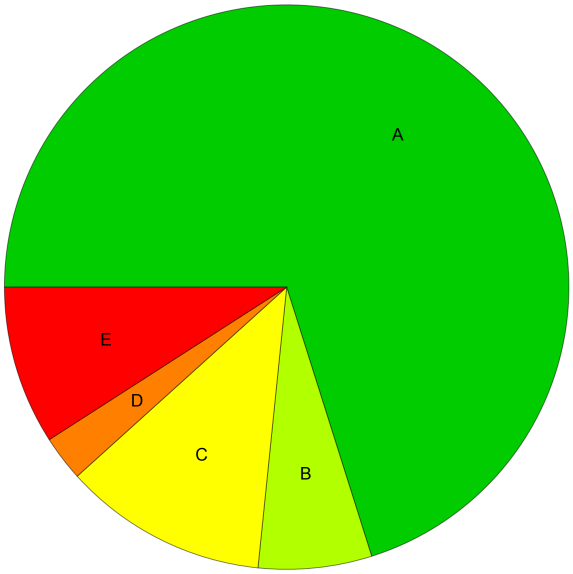
$$\text{Int}\left[\frac{1}{(c+d\,x)^2\,(a+b\,\text{Tanh}[e+f\,x])^2},\,x\right]$$

Result (type 1, 1 leaves):

???

Summary of Integration Test Results

77 integration problems



A - 54 optimal antiderivatives

B - 5 more than twice size of optimal antiderivatives

C - 9 unnecessarily complex antiderivatives

D - 2 unable to integrate problems

E - 7 integration timeouts