Rubi 4.16.0.4 Integration Test Results

on the problems in the test-suite directory "6 Hyperbolic functions"

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

Test results for the 85 problems in "6.2.7 hyper^m (a+b cosh^n)^p.m"

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

Problem 16: Unable to integrate problem.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 8, 137 leaves, 7 steps):

$$\frac{2 b^{5/2}\, d\, \text{ArcTan}\left[\frac{\sqrt{b\, \text{Tanh}[e+f x]}}{\sqrt{b}}\right]}{3 f^2} + \frac{2 b^{5/2}\, d\, \text{ArcTanh}\left[\frac{\sqrt{b\, \text{Tanh}[e+f x]}}{\sqrt{b}}\right]}{3 f^2} - \frac{4 b^2 d \sqrt{b\, \text{Tanh}[e+f x]}}{3 f^2} -$$

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

Problem 17: Unable to integrate problem.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 8, 108 leaves, 6 steps):

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

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

Problem 18: Unable to integrate problem.

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

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 8, 20 leaves, 0 steps):

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

Problem 19: Unable to integrate problem.

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

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 8, 20 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{c+d\,x}{\sqrt{b\,\text{Tanh}[e+f\,x]}},x\right]$$

Problem 20: Unable to integrate problem.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 8, 110 leaves, 6 steps):

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

Problem 21: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 1340 leaves, 38 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 8, 79 leaves, 1 step):

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

$$\frac{4 b d \text{Unintegrable}\left[(c+d x) \sqrt{b \text{Tanh}[e+f x]}, x\right]}{f}$$

Problem 24: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 1342 leaves, 38 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 8, 83 leaves, 1 step):

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

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

Test results for the 247 problems in "6.3.2 Hyperbolic tangent functions.m"

Problem 146: Unable to integrate problem.

$$\int x^3\,\text{Tanh}[a+2\,\text{Log}[x]]\,dx$$

Optimal (type 3, 29 leaves, 4 steps):

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

Result (type 8, 13 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^3\,\text{Tanh}[a+2\,\text{Log}[x]],\,x\right]$$

Problem 147: Unable to integrate problem.

$$\int x^2 \operatorname{Tanh}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 151 leaves, 11 steps):

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

Result (type 8, 13 leaves, 0 steps):

$$\operatorname{CannotIntegrate}\left[x^2 \operatorname{Tanh}[a + 2 \operatorname{Log}[x]], x\right]$$

Problem 148: Unable to integrate problem.

$$\int x \operatorname{Tanh}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 23 leaves, 4 steps):

$$\frac{x^2}{2} - e^{-a} \operatorname{ArcTan}\left[e^a x^2\right]$$

Result (type 8, 11 leaves, 0 steps):

$$\operatorname{CannotIntegrate}[x \operatorname{Tanh}[a + 2 \operatorname{Log}[x]], x]$$

Problem 149: Unable to integrate problem.

$$\int \operatorname{Tanh}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 145 leaves, 11 steps):

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

Result (type 8, 9 leaves, 0 steps):

$$\operatorname{CannotIntegrate}[\operatorname{Tanh}[a + 2 \operatorname{Log}[x]], x]$$

Problem 151: Unable to integrate problem.

$$\int \frac{\operatorname{Tanh}[a + 2 \operatorname{Log}[x]]}{x^2} \, dx$$

Optimal (type 3, 147 leaves, 11 steps):

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

Result (type 8, 13 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Tanh}[a+2\,\text{Log}[x]]}{x^{2}},\,x\right]$$

Problem 152: Unable to integrate problem.

$$\int\frac{\text{Tanh}[a+2\,\text{Log}[x]]}{x^{3}}\,dx$$

Optimal (type 3, 20 leaves, 4 steps):

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

Result (type 8, 13 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Tanh}[a+2\,\text{Log}[x]]}{x^{3}},\,x\right]$$

Problem 153: Unable to integrate problem.

$$\int x^{3}\,\text{Tanh}[a+2\,\text{Log}[x]]^{2}\,dx$$

Optimal (type 3, 47 leaves, 4 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^{3}\,\text{Tanh}[a+2\,\text{Log}[x]]^{2},\,x\right]$$

Problem 154: Unable to integrate problem.

$$\int x^{2}\,\text{Tanh}[a+2\,\text{Log}[x]]^{2}\,dx$$

Optimal (type 3, 173 leaves, 12 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^2\,\text{Tanh}[a+2\,\text{Log}[x]]^2,\,x\right]$$

Problem 155: Unable to integrate problem.

$$\int x\,\text{Tanh}[a+2\,\text{Log}[x]]^2\,dx$$

Optimal (type 3, 40 leaves, 5 steps):

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

Result (type 8, 13 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x\,\text{Tanh}[a+2\,\text{Log}[x]]^2,\,x\right]$$

Problem 156: Unable to integrate problem.

$$\int \text{Tanh}[a+2\,\text{Log}[x]]^2\,dx$$

Optimal (type 3, 165 leaves, 13 steps):

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

Result (type 8, 11 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\text{Tanh}[a+2\,\text{Log}[x]]^2,\,x\right]$$

Problem 158: Unable to integrate problem.

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

Optimal (type 3, 190 leaves, 12 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Tanh}[a+2\,\text{Log}[x]]^2}{x^2},\,x\right]$$

Problem 159: Unable to integrate problem.

$$\int \frac{\text{Tanh}[a+2\,\text{Log}[x]]^2}{x^3}\,dx$$

Optimal (type 3, 59 leaves, 5 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Tanh}[a+2\,\text{Log}[x]]^2}{x^3},\,x\right]$$

Problem 160: Unable to integrate problem.

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

Optimal (type 5, 60 leaves, 3 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Tanh}[a+2\,\text{Log}[x]],\,x\right]$$

Problem 161: Unable to integrate problem.

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

Optimal (type 5, 79 leaves, 4 steps):

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

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Tanh}[a+2\,\text{Log}[x]]^2,\,x\right]$$

Problem 162: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Tanh}[a+2\,\text{Log}[x]]^3\,dx$$

Optimal (type 5, 176 leaves, 5 steps):

$$\frac{(3+m)\ (5+m)\ (e\,x)^{1+m}}{8\,e\,(1+m)}-\frac{(e\,x)^{1+m}\left(1-e^{2\,a}\,x^4\right)^2}{4\,e\,\left(1+e^{2\,a}\,x^4\right)^2}-\frac{e^{-2\,a}\,(e\,x)^{1+m}\left(e^{2\,a}\,(3-m)+e^{4\,a}\,(5+m)\,x^4\right)}{8\,e\,\left(1+e^{2\,a}\,x^4\right)}-\frac{\left(9+2\,m+m^2\right)\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{4},\frac{5+m}{4},-e^{2\,a}\,x^4\right]}{4\,e\,(1+m)}$$

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Tanh}[a+2\,\text{Log}[x]]^3,\,x\right]$$

Problem 163: Unable to integrate problem.

$$\int \text{Tanh}[a+b\,\text{Log}[x]]^p\,dx$$

Optimal (type 6, 79 leaves, 3 steps):

$$x\,\left(1-e^{2\,a}\,x^{2\,b}\right)^{-p}\,\left(-1+e^{2\,a}\,x^{2\,b}\right)^p\,\text{AppellF1}\left[\frac{1}{2\,b},-p,p,\frac{1}{2}\left(2+\frac{1}{b}\right),e^{2\,a}\,x^{2\,b},-e^{2\,a}\,x^{2\,b}\right]$$

Result (type 8, 11 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\text{Tanh}[a+b\,\text{Log}[x]]^p,\,x\right]$$

Problem 164: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Tanh}[a+b\,\text{Log}[x]]^p\,dx$$

Optimal (type 6, 99 leaves, 3 steps):

$$\frac{1}{e\,(1+m)}(e\,x)^{1+m}\,\left(1-e^{2\,a}\,x^{2\,b}\right)^{-p}\,\left(-1+e^{2\,a}\,x^{2\,b}\right)^p\,\text{AppellF1}\left[\frac{1+m}{2\,b},-p,p,1+\frac{1+m}{2\,b},e^{2\,a}\,x^{2\,b},-e^{2\,a}\,x^{2\,b}\right]$$

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Tanh}[a+b\,\text{Log}[x]]^p,\,x\right]$$

Problem 165: Unable to integrate problem.

$$\int \text{Tanh}\left[a+\frac{\text{Log}[x]}{2}\right]^p\,dx$$

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

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

Result (type 8, 15 leaves, 1 step):

$$\text{CannotIntegrate}\left[\text{Tanh}\left[\frac{1}{2}\,(2\,a+\text{Log}[x])\right]^p,\,x\right]$$

Problem 166: Unable to integrate problem.

$$\int \mathrm{Tanh}\left[a+\frac{\mathrm{Log}[x]}{4}\right]^p dx$$

Optimal (type 5, 106 leaves, 4 steps):

$$e^{-4a}\left(-1+e^{2a}\sqrt{x}\right)^{1+p}\left(1+e^{2a}\sqrt{x}\right)^{1-p}-\frac{1}{1+p}$$
$$2^{1-p}e^{-4a}p\left(-1+e^{2a}\sqrt{x}\right)^{1+p}\mathrm{Hypergeometric2F1}\left[p,1+p,2+p,\frac{1}{2}\left(1-e^{2a}\sqrt{x}\right)\right]$$

Result (type 8, 15 leaves, 1 step):

$$\mathrm{CannotIntegrate}\left[\mathrm{Tanh}\left[\frac{1}{4}(4a+\mathrm{Log}[x])\right]^p,x\right]$$

Problem 167: Unable to integrate problem.

$$\int \mathrm{Tanh}\left[a+\frac{\mathrm{Log}[x]}{6}\right]^p dx$$

Optimal (type 5, 158 leaves, 5 steps):

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

Result (type 8, 15 leaves, 1 step):

$$\mathrm{CannotIntegrate}\left[\mathrm{Tanh}\left[\frac{1}{6}(6a+\mathrm{Log}[x])\right]^p,x\right]$$

Problem 168: Unable to integrate problem.

$$\int \mathrm{Tanh}\left[a+\frac{\mathrm{Log}[x]}{8}\right]^p dx$$

Optimal (type 5, 190 leaves, 5 steps):

$$\frac{1}{3}e^{-12a}\left(-1+e^{2a}x^{1/4}\right)^{1+p}\left(1+e^{2a}x^{1/4}\right)^{1-p}\left(e^{4a}\left(3+2p^2\right)-2e^{6a}p\,x^{1/4}\right)+$$
$$e^{-4a}\left(-1+e^{2a}x^{1/4}\right)^{1+p}\left(1+e^{2a}x^{1/4}\right)^{1-p}\sqrt{x}-\frac{1}{3(1+p)}$$
$$2^{2-p}e^{-8a}p\left(2+p^2\right)\left(-1+e^{2a}x^{1/4}\right)^{1+p}\mathrm{Hypergeometric2F1}\left[p,1+p,2+p,\frac{1}{2}\left(1-e^{2a}x^{1/4}\right)\right]$$

Result (type 8, 15 leaves, 1 step):

$$\mathrm{CannotIntegrate}\left[\mathrm{Tanh}\left[\frac{1}{8}(8a+\mathrm{Log}[x])\right]^p,x\right]$$

Problem 169: Unable to integrate problem.

$$\int \tanh[a+\log[x]]^p \, dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x \left(1-e^{2a} x^2\right)^{-p} \left(-1+e^{2a} x^2\right)^p \text{AppellF1}\left[\frac{1}{2}, -p, p, \frac{3}{2}, e^{2a} x^2, -e^{2a} x^2\right]$$

Result (type 8, 9 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\tanh[a+\log[x]]^p, x\right]$$

Problem 170: Unable to integrate problem.

$$\int \tanh[a+2\log[x]]^p \, dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x \left(1-e^{2a} x^4\right)^{-p} \left(-1+e^{2a} x^4\right)^p \text{AppellF1}\left[\frac{1}{4}, -p, p, \frac{5}{4}, e^{2a} x^4, -e^{2a} x^4\right]$$

Result (type 8, 11 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\tanh[a+2\log[x]]^p, x\right]$$

Problem 171: Unable to integrate problem.

$$\int \tanh[a+3\log[x]]^p \, dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x \left(1-e^{2a} x^6\right)^{-p} \left(-1+e^{2a} x^6\right)^p \text{AppellF1}\left[\frac{1}{6}, -p, p, \frac{7}{6}, e^{2a} x^6, -e^{2a} x^6\right]$$

Result (type 8, 11 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\tanh[a+3\log[x]]^p, x\right]$$

Problem 172: Unable to integrate problem.

$$\int x^3 \tanh\left[d \left(a+b \log\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 59 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^3 \tanh\left[d \left(a+b \log\left[c x^n\right]\right)\right], x\right]$$

Problem 173: Unable to integrate problem.

$$\int x^2 \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 63 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^2 \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right], x\right]$$

Problem 174: Unable to integrate problem.

$$\int x \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 55 leaves, 4 steps):

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

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right], x\right]$$

Problem 175: Unable to integrate problem.

$$\int \operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 53 leaves, 4 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right], x\right]$$

Problem 177: Unable to integrate problem.

$$\int \frac{\operatorname{Tanh}\left[d\left(a+b \operatorname{Log}\left[c x^n\right]\right)\right]}{x^2} dx$$

Optimal (type 5, 59 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Tanh}[d\,(a+b\,\text{Log}[c\,x^n])]}{x^2},\,x\right]$$

Problem 178: Unable to integrate problem.

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

Optimal (type 5, 56 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Tanh}[d\,(a+b\,\text{Log}[c\,x^n])]}{x^3},\,x\right]$$

Problem 179: Unable to integrate problem.

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

Optimal (type 5, 133 leaves, 5 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^3\,\text{Tanh}[d\,(a+b\,\text{Log}[c\,x^n])]^2,\,x\right]$$

Problem 180: Unable to integrate problem.

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

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

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^2\,\text{Tanh}[d\,(a+b\,\text{Log}[c\,x^n])]^2,\,x\right]$$

Problem 181: Unable to integrate problem.

$$\int x \operatorname{Tanh}\left[d \left(a + b \operatorname{Log}\left[c x^n\right]\right)\right]^2 dx$$

Optimal (type 5, 131 leaves, 5 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x \operatorname{Tanh}\left[d \left(a+b \operatorname{Log}\left[c x^n\right]\right)\right]^2, x\right]$$

Problem 182: Unable to integrate problem.

$$\int \operatorname{Tanh}\left[d \left(a + b \operatorname{Log}\left[c x^n\right]\right)\right]^2 dx$$

Optimal (type 5, 127 leaves, 5 steps):

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

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\operatorname{Tanh}\left[d \left(a+b \operatorname{Log}\left[c x^n\right]\right)\right]^2, x\right]$$

Problem 184: Unable to integrate problem.

$$\int \frac{\operatorname{Tanh}\left[d \left(a + b \operatorname{Log}\left[c x^n\right]\right)\right]^2}{x^2} dx$$

Optimal (type 5, 135 leaves, 5 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\operatorname{Tanh}\left[d \left(a+b \operatorname{Log}\left[c x^n\right]\right)\right]^2}{x^2}, x\right]$$

Problem 185: Unable to integrate problem.

$$\int \frac{\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right]^2}{x^3}\,dx$$

Optimal (type 5, 136 leaves, 5 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\mathrm{CannotIntegrate}\left[\frac{\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right]^2}{x^3},x\right]$$

Problem 189: Unable to integrate problem.

$$\int (e\,x)^m\,\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right]\,dx$$

Optimal (type 5, 88 leaves, 4 steps):

$$\frac{(e\,x)^{1+m}}{e\,(1+m)}-\frac{2\,(e\,x)^{1+m}\,\mathrm{Hypergeometric2F1}\left[1,\frac{1+m}{2\,b\,d\,n},1+\frac{1+m}{2\,b\,d\,n},-e^{2\,a\,d}\left(c\,x^n\right)^{2\,b\,d}\right]}{e\,(1+m)}$$

Result (type 8, 21 leaves, 0 steps):

$$\mathrm{CannotIntegrate}\left[(e\,x)^m\,\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right],x\right]$$

Problem 190: Unable to integrate problem.

$$\int (e\,x)^m\,\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right]^2\,dx$$

Optimal (type 5, 169 leaves, 5 steps):

$$\frac{(1+m+b\,d\,n)\,(e\,x)^{1+m}}{b\,d\,e\,(1+m)\,n}+\frac{(e\,x)^{1+m}\left(1-e^{2\,a\,d}\left(c\,x^n\right)^{2\,b\,d}\right)}{b\,d\,e\,n\left(1+e^{2\,a\,d}\left(c\,x^n\right)^{2\,b\,d}\right)}-$$
$$\frac{2\,(e\,x)^{1+m}\,\mathrm{Hypergeometric2F1}\left[1,\frac{1+m}{2\,b\,d\,n},1+\frac{1+m}{2\,b\,d\,n},-e^{2\,a\,d}\left(c\,x^n\right)^{2\,b\,d}\right]}{b\,d\,e\,n}$$

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

$$\mathrm{CannotIntegrate}\left[(e\,x)^m\,\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right]^2,x\right]$$

Problem 191: Unable to integrate problem.

$$\int (e\,x)^m\,\mathrm{Tanh}\left[d\left(a+b\,\mathrm{Log}\left[c\,x^n\right]\right)\right]^3\,dx$$

Optimal (type 5, 307 leaves, 6 steps):

$$\frac{(1+m+b d n)\,(1+m+2 b d n)\,(e x)^{1+m}}{2 b^2 d^2 e\,(1+m)\,n^2}-\frac{(e x)^{1+m}\left(1-e^{2 a d}\,(c x^n)^{2 b d}\right)^2}{2 b d e n\left(1+e^{2 a d}\,(c x^n)^{2 b d}\right)^2}+$$

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

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

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

$$\text{CannotIntegrate}\left[(e x)^m\,\text{Tanh}[d\,(a+b\,\text{Log}[c x^n])]^3,x\right]$$

Problem 192: Unable to integrate problem.

$$\int \text{Tanh}[d\,(a+b\,\text{Log}[c x^n])]^p\,dx$$

Optimal (type 6, 115 leaves, 4 steps):

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

$$\text{AppellF1}\left[\frac{1}{2 b d n},-p,p,1+\frac{1}{2 b d n},e^{2 a d}\,(c x^n)^{2 b d},-e^{2 a d}\,(c x^n)^{2 b d}\right]$$

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\text{Tanh}[d\,(a+b\,\text{Log}[c x^n])]^p,x\right]$$

Problem 193: Unable to integrate problem.

$$\int (e x)^m\,\text{Tanh}[d\,(a+b\,\text{Log}[c x^n])]^p\,dx$$

Optimal (type 6, 135 leaves, 4 steps):

$$\frac{1}{e\,(1+m)}(e x)^{1+m}\left(1-e^{2 a d}\,(c x^n)^{2 b d}\right)^{-p}\left(-1+e^{2 a d}\,(c x^n)^{2 b d}\right)^p$$

$$\text{AppellF1}\left[\frac{1+m}{2 b d n},-p,p,1+\frac{1+m}{2 b d n},e^{2 a d}\,(c x^n)^{2 b d},-e^{2 a d}\,(c x^n)^{2 b d}\right]$$

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

$$\text{CannotIntegrate}\left[(e x)^m\,\text{Tanh}[d\,(a+b\,\text{Log}[c x^n])]^p,x\right]$$

Test results for the 263 problems in "6.3.7 (d hyper)^m (a+b (c tanh)^n)^p.m"

Test results for the 61 problems in "6.4.1 (c+d x)^m (a+b coth)^n.m"

Test results for the 224 problems in "6.4.2 Hyperbolic cotangent functions.m"

Problem 151: Unable to integrate problem.

$$\int x^3 \operatorname{Coth}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 30 leaves, 4 steps):

$$\frac{x^4}{4} + \frac{1}{2} e^{-2 a} \operatorname{Log}\left[1 - e^{2 a} x^4\right]$$

Result (type 8, 13 leaves, 0 steps):

$$\operatorname{CannotIntegrate}\left[x^3 \operatorname{Coth}[a + 2 \operatorname{Log}[x]], x\right]$$

Problem 152: Unable to integrate problem.

$$\int x^2 \operatorname{Coth}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 45 leaves, 5 steps):

$$\frac{x^3}{3} + e^{-3 a/2} \operatorname{ArcTan}\left[e^{a/2} x\right] - e^{-3 a/2} \operatorname{ArcTanh}\left[e^{a/2} x\right]$$

Result (type 8, 13 leaves, 0 steps):

$$\operatorname{CannotIntegrate}\left[x^2 \operatorname{Coth}[a + 2 \operatorname{Log}[x]], x\right]$$

Problem 153: Unable to integrate problem.

$$\int x \operatorname{Coth}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 23 leaves, 4 steps):

$$\frac{x^2}{2} - e^{-a} \operatorname{ArcTanh}\left[e^{a} x^2\right]$$

Result (type 8, 11 leaves, 0 steps):

$$\operatorname{CannotIntegrate}[x \operatorname{Coth}[a + 2 \operatorname{Log}[x]], x]$$

Problem 154: Unable to integrate problem.

$$\int \operatorname{Coth}[a + 2 \operatorname{Log}[x]] \, dx$$

Optimal (type 3, 40 leaves, 5 steps):

$x - e^{-a/2} \text{ArcTan}\left[e^{a/2} x\right] - e^{-a/2} \text{ArcTanh}\left[e^{a/2} x\right]$

Result (type 8, 9 leaves, 0 steps):

CannotIntegrate[Coth[a + 2 Log[x]], x]

Problem 156: Unable to integrate problem.

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

Optimal (type 3, 41 leaves, 5 steps):

$\frac{1}{x} + e^{a/2} \text{ArcTan}\left[e^{a/2} x\right] - e^{a/2} \text{ArcTanh}\left[e^{a/2} x\right]$

Result (type 8, 13 leaves, 0 steps):

$\text{CannotIntegrate}\left[\frac{\text{Coth}[a + 2 \text{Log}[x]]}{x^2}, x\right]$

Problem 157: Unable to integrate problem.

$$\int \frac{\text{Coth}[a + 2 \text{Log}[x]]}{x^3} \, dx$$

Optimal (type 3, 21 leaves, 4 steps):

$\frac{1}{2 x^2} - e^a \text{ArcTanh}\left[e^a x^2\right]$

Result (type 8, 13 leaves, 0 steps):

$\text{CannotIntegrate}\left[\frac{\text{Coth}[a + 2 \text{Log}[x]]}{x^3}, x\right]$

Problem 158: Unable to integrate problem.

$$\int x^3 \, \text{Coth}[a + 2 \text{Log}[x]]^2 \, dx$$

Optimal (type 3, 47 leaves, 4 steps):

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

Result (type 8, 15 leaves, 0 steps):

$\text{CannotIntegrate}\left[x^3 \, \text{Coth}[a + 2 \text{Log}[x]]^2, x\right]$

Problem 159: Unable to integrate problem.

$$\int x^2 \operatorname{Coth}[a+2 \operatorname{Log}[x]]^2 \, dx$$

Optimal (type 3, 68 leaves, 6 steps):

$$\frac{x^3}{3}+\frac{x^3}{1-e^{2 a} x^4}+\frac{3}{2} e^{-3 a/2} \operatorname{ArcTan}\left[e^{a/2} x\right]-\frac{3}{2} e^{-3 a/2} \operatorname{ArcTanh}\left[e^{a/2} x\right]$$

Result (type 8, 15 leaves, 0 steps):

CannotIntegrate$\left[x^2 \operatorname{Coth}[a+2 \operatorname{Log}[x]]^2, x\right]$

Problem 160: Unable to integrate problem.

$$\int x \operatorname{Coth}[a+2 \operatorname{Log}[x]]^2 \, dx$$

Optimal (type 3, 41 leaves, 5 steps):

$$\frac{x^2}{2}+\frac{x^2}{1-e^{2 a} x^4}-e^{-a} \operatorname{ArcTanh}\left[e^a x^2\right]$$

Result (type 8, 13 leaves, 0 steps):

CannotIntegrate$\left[x \operatorname{Coth}[a+2 \operatorname{Log}[x]]^2, x\right]$

Problem 161: Unable to integrate problem.

$$\int \operatorname{Coth}[a+2 \operatorname{Log}[x]]^2 \, dx$$

Optimal (type 3, 60 leaves, 7 steps):

$$x+\frac{x}{1-e^{2 a} x^4}-\frac{1}{2} e^{-a/2} \operatorname{ArcTan}\left[e^{a/2} x\right]-\frac{1}{2} e^{-a/2} \operatorname{ArcTanh}\left[e^{a/2} x\right]$$

Result (type 8, 11 leaves, 0 steps):

CannotIntegrate$\left[\operatorname{Coth}[a+2 \operatorname{Log}[x]]^2, x\right]$

Problem 163: Unable to integrate problem.

$$\int \frac{\operatorname{Coth}[a+2 \operatorname{Log}[x]]^2}{x^2} \, dx$$

Optimal (type 3, 86 leaves, 6 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Coth}[a+2\,\text{Log}[x]]^2}{x^2},\,x\right]$$

Problem 164: Unable to integrate problem.

$$\int \frac{\text{Coth}[a+2\,\text{Log}[x]]^2}{x^3}\,dx$$

Optimal (type 3, 60 leaves, 5 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Coth}[a+2\,\text{Log}[x]]^2}{x^3},\,x\right]$$

Problem 165: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}[a+2\,\text{Log}[x]]\,dx$$

Optimal (type 5, 59 leaves, 3 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}[a+2\,\text{Log}[x]],\,x\right]$$

Problem 166: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}[a+2\,\text{Log}[x]]^2\,dx$$

Optimal (type 5, 79 leaves, 4 steps):

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

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}[a+2\,\text{Log}[x]]^2,\,x\right]$$

Problem 167: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}[a+2\,\text{Log}[x]]^3\,dx$$

Optimal (type 5, 177 leaves, 5 steps):

$$\frac{(3+m)\ (5+m)\ (e\,x)^{1+m}}{8\,e\,(1+m)} - \frac{(e\,x)^{1+m}\left(1+e^{2\,a}\,x^4\right)^2}{4\,e\left(1-e^{2\,a}\,x^4\right)^2} - \frac{e^{-2\,a}\,(e\,x)^{1+m}\left(e^{2\,a}\,(3-m) - e^{4\,a}\,(5+m)\,x^4\right)}{8\,e\left(1-e^{2\,a}\,x^4\right)} - \frac{\left(9+2\,m+m^2\right)\,(e\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{4},\frac{5+m}{4},e^{2\,a}\,x^4\right]}{4\,e\,(1+m)}$$

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}[a+2\,\text{Log}[x]]^3,\,x\right]$$

Problem 168: Unable to integrate problem.

$$\int \text{Coth}[a+b\,\text{Log}[x]]^p\,dx$$

Optimal (type 6, 79 leaves, 3 steps):

$$x\left(-1-e^{2\,a}\,x^{2\,b}\right)^p\left(1+e^{2\,a}\,x^{2\,b}\right)^{-p}\,\text{AppellF1}\left[\frac{1}{2\,b},\,p,\,-p,\,\frac{1}{2}\left(2+\frac{1}{b}\right),\,e^{2\,a}\,x^{2\,b},\,-e^{2\,a}\,x^{2\,b}\right]$$

Result (type 8, 11 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\text{Coth}[a+b\,\text{Log}[x]]^p,\,x\right]$$

Problem 169: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}[a+b\,\text{Log}[x]]^p\,dx$$

Optimal (type 6, 99 leaves, 3 steps):

$$\frac{1}{e\,(1+m)}(e\,x)^{1+m}\left(-1-e^{2\,a}\,x^{2\,b}\right)^p\left(1+e^{2\,a}\,x^{2\,b}\right)^{-p}\,\text{AppellF1}\left[\frac{1+m}{2\,b},\,p,\,-p,\,1+\frac{1+m}{2\,b},\,e^{2\,a}\,x^{2\,b},\,-e^{2\,a}\,x^{2\,b}\right]$$

Result (type 8, 17 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}[a+b\,\text{Log}[x]]^p,\,x\right]$$

Problem 170: Unable to integrate problem.

$$\int \text{Coth}\left[a+\frac{\text{Log}[x]}{2}\right]^p\,dx$$

Optimal (type 5, 52 leaves, 2 steps):

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

Result (type 8, 15 leaves, 1 step):

$$\text{CannotIntegrate}\left[\text{Coth}\left[\frac{1}{2}\,(2\,a+\text{Log}[x])\right]^p,\,x\right]$$

Problem 171: Unable to integrate problem.

$$\int \operatorname{Coth}\left[a+\frac{\operatorname{Log}[x]}{4}\right]^p dx$$

Optimal (type 5, 108 leaves, 4 steps):

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

Result (type 8, 15 leaves, 1 step):

$$\text{CannotIntegrate}\left[\operatorname{Coth}\left[\frac{1}{4}(4a+\operatorname{Log}[x])\right]^p, x\right]$$

Problem 172: Unable to integrate problem.

$$\int \operatorname{Coth}\left[a+\frac{\operatorname{Log}[x]}{6}\right]^p dx$$

Optimal (type 5, 162 leaves, 5 steps):

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

Result (type 8, 15 leaves, 1 step):

$$\text{CannotIntegrate}\left[\operatorname{Coth}\left[\frac{1}{6}(6a+\operatorname{Log}[x])\right]^p, x\right]$$

Problem 173: Unable to integrate problem.

$$\int \operatorname{Coth}\left[a+\frac{\operatorname{Log}[x]}{8}\right]^p dx$$

Optimal (type 5, 194 leaves, 5 steps):

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

Result (type 8, 15 leaves, 1 step):

$$\text{CannotIntegrate}\left[\operatorname{Coth}\left[\frac{1}{8}(8a+\operatorname{Log}[x])\right]^p, x\right]$$

Problem 174: Unable to integrate problem.

$$\int \operatorname{Coth}[a + \operatorname{Log}[x]]^p \, dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x \left(-1 - e^{2a} x^2\right)^p \left(1 + e^{2a} x^2\right)^{-p} \operatorname{AppellF1}\left[\frac{1}{2}, p, -p, \frac{3}{2}, e^{2a} x^2, -e^{2a} x^2\right]$$

Result (type 8, 9 leaves, 0 steps):

CannotIntegrate[Coth[a + Log[x]]^p, x]

Problem 175: Unable to integrate problem.

$$\int \operatorname{Coth}[a + 2 \operatorname{Log}[x]]^p \, dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x \left(-1 - e^{2a} x^4\right)^p \left(1 + e^{2a} x^4\right)^{-p} \operatorname{AppellF1}\left[\frac{1}{4}, p, -p, \frac{5}{4}, e^{2a} x^4, -e^{2a} x^4\right]$$

Result (type 8, 11 leaves, 0 steps):

CannotIntegrate[Coth[a + 2 Log[x]]^p, x]

Problem 176: Unable to integrate problem.

$$\int \operatorname{Coth}[a + 3 \operatorname{Log}[x]]^p \, dx$$

Optimal (type 6, 61 leaves, 3 steps):

$$x \left(-1 - e^{2a} x^6\right)^p \left(1 + e^{2a} x^6\right)^{-p} \operatorname{AppellF1}\left[\frac{1}{6}, p, -p, \frac{7}{6}, e^{2a} x^6, -e^{2a} x^6\right]$$

Result (type 8, 11 leaves, 0 steps):

CannotIntegrate[Coth[a + 3 Log[x]]^p, x]

Problem 177: Unable to integrate problem.

$$\int x^3 \operatorname{Coth}\left[d \left(a + b \operatorname{Log}\left[c x^n\right]\right)\right] dx$$

Optimal (type 5, 58 leaves, 4 steps):

$$\frac{x^4}{4} - \frac{1}{2} x^4 \operatorname{Hypergeometric2F1}\left[1, \frac{2}{b d n}, 1 + \frac{2}{b d n}, e^{2 a d} \left(c x^n\right)^{2 b d}\right]$$

Result (type 8, 19 leaves, 0 steps):

CannotIntegrate[x^3 Coth[d (a + b Log[c x^n])], x]

Problem 178: Unable to integrate problem.

$$\int x^2 \,\mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right] \,dx$$

Optimal (type 5, 62 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\mathrm{CannotIntegrate}\left[x^2 \,\mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right],x\right]$$

Problem 179: Unable to integrate problem.

$$\int x \,\mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right] \,dx$$

Optimal (type 5, 54 leaves, 4 steps):

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

Result (type 8, 17 leaves, 0 steps):

$$\mathrm{CannotIntegrate}\left[x \,\mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right],x\right]$$

Problem 180: Unable to integrate problem.

$$\int \mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right] \,dx$$

Optimal (type 5, 52 leaves, 4 steps):

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

Result (type 8, 15 leaves, 0 steps):

$$\mathrm{CannotIntegrate}\left[\mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right],x\right]$$

Problem 182: Unable to integrate problem.

$$\int \frac{\mathrm{Coth}\left[d \left(a+b \,\mathrm{Log}\left[c\, x^n\right]\right)\right]}{x^2} \,dx$$

Optimal (type 5, 58 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]}{x^2},\,x\right]$$

Problem 183: Unable to integrate problem.

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

Optimal (type 5, 55 leaves, 4 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]}{x^3},\,x\right]$$

Problem 184: Unable to integrate problem.

$$\int x^3\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^2\,dx$$

Optimal (type 5, 132 leaves, 5 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^3\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^2,\,x\right]$$

Problem 185: Unable to integrate problem.

$$\int x^2\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^2\,dx$$

Optimal (type 5, 136 leaves, 5 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[x^2\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^2,\,x\right]$$

Problem 186: Unable to integrate problem.

$$\int x \operatorname{Coth}[d (a + b \operatorname{Log}[c x^n])]^2 \, dx$$

Optimal (type 5, 130 leaves, 5 steps):

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

Result (type 8, 19 leaves, 0 steps):

$$\operatorname{CannotIntegrate}\left[x \operatorname{Coth}[d (a + b \operatorname{Log}[c x^n])]^2, x\right]$$

Problem 187: Unable to integrate problem.

$$\int \operatorname{Coth}[d (a + b \operatorname{Log}[c x^n])]^2 \, dx$$

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

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

Result (type 8, 17 leaves, 0 steps):

$$\operatorname{CannotIntegrate}\left[\operatorname{Coth}[d (a + b \operatorname{Log}[c x^n])]^2, x\right]$$

Problem 189: Unable to integrate problem.

$$\int \frac{\operatorname{Coth}[d (a + b \operatorname{Log}[c x^n])]^2}{x^2} \, dx$$

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

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

Result (type 8, 21 leaves, 0 steps):

$$\operatorname{CannotIntegrate}\left[\frac{\operatorname{Coth}[d (a + b \operatorname{Log}[c x^n])]^2}{x^2}, x\right]$$

Problem 190: Unable to integrate problem.

$$\int \frac{\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]^2}{x^3}\,dx$$

Optimal (type 5, 135 leaves, 5 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]^2}{x^3},x\right]$$

Problem 194: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]\,dx$$

Optimal (type 5, 87 leaves, 4 steps):

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

Result (type 8, 21 leaves, 0 steps):

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right],x\right]$$

Problem 195: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]^2\,dx$$

Optimal (type 5, 168 leaves, 5 steps):

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

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

$$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]^2,x\right]$$

Problem 196: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}\left[d\left(a+b\,\text{Log}\left[c\,x^n\right]\right)\right]^3\,dx$$

Optimal (type 5, 306 leaves, 6 steps):

$$\frac{(1+m+b\,d\,n)\,(1+m+2\,b\,d\,n)\,(e\,x)^{1+m}}{2\,b^2\,d^2\,e\,(1+m)\,n^2}-\frac{(e\,x)^{1+m}\left(1+e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d}\right)^2}{2\,b\,d\,e\,n\left(1-e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d}\right)^2}+$$

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

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

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

$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^3,x\right]$

Problem 197: Unable to integrate problem.

$$\int \text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^p\,dx$$

Optimal (type 6, 115 leaves, 4 steps):

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

$$\text{AppellF1}\left[\frac{1}{2\,b\,d\,n},p,-p,1+\frac{1}{2\,b\,d\,n},e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d},-e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d}\right]$$

Result (type 8, 17 leaves, 0 steps):

$\text{CannotIntegrate}\left[\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^p,x\right]$

Problem 198: Unable to integrate problem.

$$\int (e\,x)^m\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^p\,dx$$

Optimal (type 6, 135 leaves, 4 steps):

$$\frac{1}{e\,(1+m)}(e\,x)^{1+m}\left(-1-e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d}\right)^p\left(1+e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d}\right)^{-p}$$

$$\text{AppellF1}\left[\frac{1+m}{2\,b\,d\,n},p,-p,1+\frac{1+m}{2\,b\,d\,n},e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d},-e^{2\,a\,d}\,(c\,x^n)^{2\,b\,d}\right]$$

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

$\text{CannotIntegrate}\left[(e\,x)^m\,\text{Coth}[d\,(a+b\,\text{Log}[c\,x^n])]^p,x\right]$

Test results for the 53 problems in "6.4.7 (d hyper)^m (a+b (c coth)^n)^p.m"

Test results for the 16 problems in "6.5.1 (c+d x)^m (a+b sech)^n.m"

Test results for the 84 problems in "6.5.2 (e x)^m (a+b sech(c+d x^n))^p.m"

Test results for the 201 problems in "6.5.3 Hyperbolic secant functions.m"

Problem 186: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(\left(1-b^2 n^2\right) \text{Sech}\left[a+b \text{Log}\left[c x^n\right]\right]+2 b^2 n^2 \text{Sech}\left[a+b \text{Log}\left[c x^n\right]\right]^3\right) \, dx$$

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

$$x \text{Sech}\left[a+b \text{Log}\left[c x^n\right]\right]+b n x \text{Sech}\left[a+b \text{Log}\left[c x^n\right]\right] \text{Tanh}\left[a+b \text{Log}\left[c x^n\right]\right]$$

Result (type 5, 139 leaves, 9 steps):

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

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

Test results for the 220 problems in "6.5.7 (d hyper)^m (a+b (c sech)^n)^p.m"

Test results for the 29 problems in "6.6.1 (c+d x)^m (a+b csch)^n.m"

Test results for the 83 problems in "6.6.2 (e x)^m (a+b csch(c+d x^n))^p.m"

Test results for the 175 problems in "6.6.3 Hyperbolic cosecant functions.m"

Problem 160: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(-\left(1-b^2 n^2\right) \text{Csch}\left[a+b \text{Log}\left[c x^n\right]\right]+2 b^2 n^2 \text{Csch}\left[a+b \text{Log}\left[c x^n\right]\right]^3\right) dx$$

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

$$-x \text{Csch}\left[a+b \text{Log}\left[c x^n\right]\right]-b n x \text{Coth}\left[a+b \text{Log}\left[c x^n\right]\right] \text{Csch}\left[a+b \text{Log}\left[c x^n\right]\right]$$

Result (type 5, 137 leaves, 9 steps) :

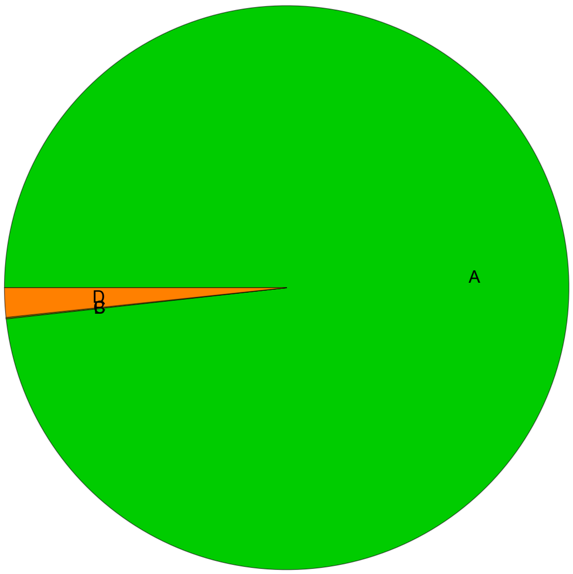
$$2 e^a (1-b n) x \left(c x^n\right)^b \text{Hypergeometric2F1}\left[1, \frac{b+\frac{1}{n}}{2 b}, \frac{1}{2}\left(3+\frac{1}{b n}\right), e^{2 a} \left(c x^n\right)^{2 b}\right]-$$
$$\frac{1}{1+3 b n} 16 b^2 e^{3 a} n^2 x \left(c x^n\right)^{3 b} \text{Hypergeometric2F1}\left[3, \frac{3 b+\frac{1}{n}}{2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

Test results for the 27 problems in "6.6.7 (d hyper)^m (a+b (c csch)^n)^p.m"

Test results for the 1059 problems in "6.7.1 Hyperbolic functions.m"

Summary of Integration Test Results

5166 integration problems



A - 5075 optimal antiderivatives

B - 2 valid but suboptimal antiderivatives

C - 2 unnecessarily complex antiderivatives

D - 87 unable to integrate problems

E - 0 integration timeouts

F - 0 invalid antiderivatives