Rubi 4.16.1.4 Integration Test Results

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

Test results for the 502 problems in "6.1.1 (c+d x)^m (a+b sinh)^n.m"

Test results for the 102 problems in "6.1.3 (e x)^m (a+b sinh(c+d x^n))^p.m"

Test results for the 33 problems in "6.1.4 (d+e x)^m sinh(a+b x+c x^2)^n.m"

Test results for the 369 problems in "6.1.5 Hyperbolic sine functions.m"

Test results for the 525 problems in "6.1.7 hyper^m (a+b sinh^n)^p.m"

Test results for the 183 problems in "6.2.1 (c+d x)^m (a+b cosh)^n.m"

Test results for the 111 problems in "6.2.2 (e x)^m (a+b x^n)^p cosh.m"

Test results for the 68 problems in "6.2.3 (e x)^m (a+b cosh(c+d x^n))^p.m"

Test results for the 33 problems in "6.2.4 (d+e x)^m cosh(a+b x+c x^2)^n.m"

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"

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

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"

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) :

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

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

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) :

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

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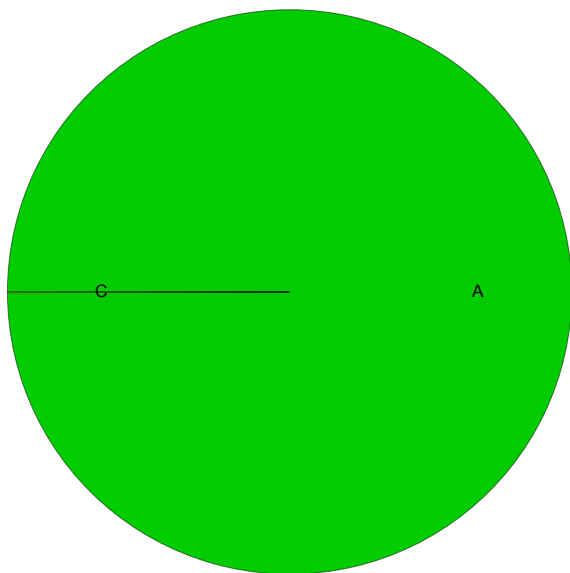

Test results for the 27 problems in "6.6.7 (d hyper)^m (a+b (c

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 - 5164 optimal antiderivatives

B - 0 valid but suboptimal antiderivatives

C - 2 unnecessarily complex antiderivatives

D - 0 unable to integrate problems

E - 0 integration timeouts

F - 0 invalid antiderivatives