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):

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

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):

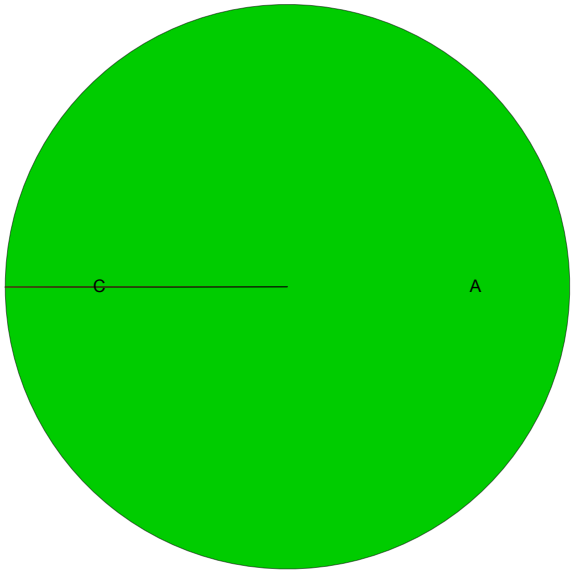
$$2 e^a (1-b n) x \left(c x^n\right)^b \text{Hypergeometric2F1}\left[1, \frac{b+\frac{1}{n}}{2 b}, \frac{1}{2}\left(3+\frac{1}{b n}\right), e^{2 a}\left(c x^n\right)^{2 b}\right]-\frac{16 b^2 e^{3 a} n^2 x \left(c x^n\right)^{3 b} \text{Hypergeometric2F1}\left[3, \frac{3 b+\frac{1}{n}}{2 b}, \frac{1}{2}\left(5+\frac{1}{b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

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