

Rubi 4.16.0.4 Integration Test Results

on the problems in the test-suite directory "2 Exponentials"

Test results for the 98 problems in "2.1 u (F^(c (a+b x)))^n.m"

Test results for the 93 problems in "2.2 (c+d x)^m (F^(g (e+f x)))^n (a+b (F^(g (e+f x))))^p.m"

Test results for the 774 problems in "2.3 Exponential functions.m"

Problem 70: Result unnecessarily involves higher level functions.

$$\int f^{a+bx^2} x^{11} dx$$

Optimal (type 3, 78 leaves, 1 step):

$$\frac{f^{a+bx^2} (120 - 120 b x^2 \operatorname{Log}[f] + 60 b^2 x^4 \operatorname{Log}[f]^2 - 20 b^3 x^6 \operatorname{Log}[f]^3 + 5 b^4 x^8 \operatorname{Log}[f]^4 - b^5 x^{10} \operatorname{Log}[f]^5)}{2 b^6 \operatorname{Log}[f]^6}$$

Result (type 4, 24 leaves, 1 step):

$$\frac{f^a \operatorname{Gamma}[6, -b x^2 \operatorname{Log}[f]]}{2 b^6 \operatorname{Log}[f]^6}$$

Problem 71: Result unnecessarily involves higher level functions.

$$\int f^{a+bx^2} x^9 dx$$

Optimal (type 3, 65 leaves, 1 step):

$$\frac{f^{a+bx^2} (24 - 24 b x^2 \operatorname{Log}[f] + 12 b^2 x^4 \operatorname{Log}[f]^2 - 4 b^3 x^6 \operatorname{Log}[f]^3 + b^4 x^8 \operatorname{Log}[f]^4)}{2 b^5 \operatorname{Log}[f]^5}$$

Result (type 4, 24 leaves, 1 step):

$$\frac{f^a \text{Gamma}[5, -b x^2 \text{Log}[f]]}{2 b^5 \text{Log}[f]^5}$$

Problem 96: Result unnecessarily involves higher level functions.

$$\int f^{a+bx^3} x^{17} dx$$

Optimal (type 3, 78 leaves, 1 step):

$$\frac{f^{a+bx^3} (120 - 120 b x^3 \text{Log}[f] + 60 b^2 x^6 \text{Log}[f]^2 - 20 b^3 x^9 \text{Log}[f]^3 + 5 b^4 x^{12} \text{Log}[f]^4 - b^5 x^{15} \text{Log}[f]^5)}{3 b^6 \text{Log}[f]^6}$$

Result (type 4, 24 leaves, 1 step):

$$\frac{f^a \text{Gamma}[6, -b x^3 \text{Log}[f]]}{3 b^6 \text{Log}[f]^6}$$

Problem 97: Result unnecessarily involves higher level functions.

$$\int f^{a+bx^3} x^{14} dx$$

Optimal (type 3, 65 leaves, 1 step):

$$\frac{f^{a+bx^3} (24 - 24 b x^3 \text{Log}[f] + 12 b^2 x^6 \text{Log}[f]^2 - 4 b^3 x^9 \text{Log}[f]^3 + b^4 x^{12} \text{Log}[f]^4)}{3 b^5 \text{Log}[f]^5}$$

Result (type 4, 24 leaves, 1 step):

$$\frac{f^a \text{Gamma}[5, -b x^3 \text{Log}[f]]}{3 b^5 \text{Log}[f]^5}$$

Problem 126: Result unnecessarily involves higher level functions.

$$\int \frac{f^{a+\frac{b}{x}}}{x^6} dx$$

Optimal (type 3, 65 leaves, 1 step):

$$\frac{f^{a+\frac{b}{x}} (24 x^4 - 24 b x^3 \text{Log}[f] + 12 b^2 x^2 \text{Log}[f]^2 - 4 b^3 x \text{Log}[f]^3 + b^4 \text{Log}[f]^4)}{b^5 x^4 \text{Log}[f]^5}$$

Result (type 4, 22 leaves, 1 step):

$$-\frac{f^a \text{Gamma}\left[5, -\frac{b \text{Log}[f]}{x}\right]}{b^5 \text{Log}[f]^5}$$

Problem 127: Result unnecessarily involves higher level functions.

$$\int \frac{f^{a+\frac{b}{x}}}{x^7} dx$$

Optimal (type 3, 77 leaves, 1 step):

$$\frac{f^{a+\frac{b}{x}} \left(120 x^5 - 120 b x^4 \text{Log}[f] + 60 b^2 x^3 \text{Log}[f]^2 - 20 b^3 x^2 \text{Log}[f]^3 + 5 b^4 x \text{Log}[f]^4 - b^5 \text{Log}[f]^5\right)}{b^6 x^5 \text{Log}[f]^6}$$

Result (type 4, 21 leaves, 1 step):

$$\frac{f^a \text{Gamma}\left[6, -\frac{b \text{Log}[f]}{x}\right]}{b^6 \text{Log}[f]^6}$$

Problem 139: Result unnecessarily involves higher level functions.

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{11}} dx$$

Optimal (type 3, 69 leaves, 1 step):

$$-\frac{f^{a+\frac{b}{x^2}} \left(24 x^8 - 24 b x^6 \text{Log}[f] + 12 b^2 x^4 \text{Log}[f]^2 - 4 b^3 x^2 \text{Log}[f]^3 + b^4 \text{Log}[f]^4\right)}{2 b^5 x^8 \text{Log}[f]^5}$$

Result (type 4, 24 leaves, 1 step):

$$-\frac{f^a \text{Gamma}\left[5, -\frac{b \text{Log}[f]}{x^2}\right]}{2 b^5 \text{Log}[f]^5}$$

Problem 140: Result unnecessarily involves higher level functions.

$$\int \frac{f^{a+\frac{b}{x^2}}}{x^{13}} dx$$

Optimal (type 3, 82 leaves, 1 step):

$$\frac{f^{a+\frac{b}{x^2}} (120 x^{10} - 120 b x^8 \operatorname{Log}[f] + 60 b^2 x^6 \operatorname{Log}[f]^2 - 20 b^3 x^4 \operatorname{Log}[f]^3 + 5 b^4 x^2 \operatorname{Log}[f]^4 - b^5 \operatorname{Log}[f]^5)}{2 b^6 x^{10} \operatorname{Log}[f]^6}$$

Result (type 4, 24 leaves, 1 step):

$$\frac{f^a \operatorname{Gamma}\left[6, -\frac{b \operatorname{Log}[f]}{x^2}\right]}{2 b^6 \operatorname{Log}[f]^6}$$

Problem 165: Result unnecessarily involves higher level functions.

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{16}} dx$$

Optimal (type 3, 69 leaves, 1 step):

$$-\frac{f^{a+\frac{b}{x^3}} (24 x^{12} - 24 b x^9 \operatorname{Log}[f] + 12 b^2 x^6 \operatorname{Log}[f]^2 - 4 b^3 x^3 \operatorname{Log}[f]^3 + b^4 \operatorname{Log}[f]^4)}{3 b^5 x^{12} \operatorname{Log}[f]^5}$$

Result (type 4, 24 leaves, 1 step):

$$-\frac{f^a \operatorname{Gamma}\left[5, -\frac{b \operatorname{Log}[f]}{x^3}\right]}{3 b^5 \operatorname{Log}[f]^5}$$

Problem 166: Result unnecessarily involves higher level functions.

$$\int \frac{f^{a+\frac{b}{x^3}}}{x^{19}} dx$$

Optimal (type 3, 82 leaves, 1 step):

$$\frac{f^{a+\frac{b}{x^3}} (120 x^{15} - 120 b x^{12} \operatorname{Log}[f] + 60 b^2 x^9 \operatorname{Log}[f]^2 - 20 b^3 x^6 \operatorname{Log}[f]^3 + 5 b^4 x^3 \operatorname{Log}[f]^4 - b^5 \operatorname{Log}[f]^5)}{3 b^6 x^{15} \operatorname{Log}[f]^6}$$

Result (type 4, 24 leaves, 1 step):

$$\frac{f^a \operatorname{Gamma}\left[6, -\frac{b \operatorname{Log}[f]}{x^3}\right]}{3 b^6 \operatorname{Log}[f]^6}$$

Problem 255: Result unnecessarily involves higher level functions.

$$\int F^{a+b(c+dx)^2} (c+dx)^{11} dx$$

Optimal (type 3, 105 leaves, 1 step):

$$\frac{1}{2 b^6 d \operatorname{Log}[F]^6} F^{a+b(c+dx)^2} \left(120 - 120 b (c+dx)^2 \operatorname{Log}[F] + 60 b^2 (c+dx)^4 \operatorname{Log}[F]^2 - 20 b^3 (c+dx)^6 \operatorname{Log}[F]^3 + 5 b^4 (c+dx)^8 \operatorname{Log}[F]^4 - b^5 (c+dx)^{10} \operatorname{Log}[F]^5 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[6, -b(c+dx)^2 \operatorname{Log}[F]\right]}{2 b^6 d \operatorname{Log}[F]^6}$$

Problem 256: Result unnecessarily involves higher level functions.

$$\int F^{a+b(c+dx)^2} (c+dx)^9 dx$$

Optimal (type 3, 88 leaves, 1 step):

$$\frac{1}{2 b^5 d \operatorname{Log}[F]^5} F^{a+b(c+dx)^2} \left(24 - 24 b (c+dx)^2 \operatorname{Log}[F] + 12 b^2 (c+dx)^4 \operatorname{Log}[F]^2 - 4 b^3 (c+dx)^6 \operatorname{Log}[F]^3 + b^4 (c+dx)^8 \operatorname{Log}[F]^4 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[5, -b(c+dx)^2 \operatorname{Log}[F]\right]}{2 b^5 d \operatorname{Log}[F]^5}$$

Problem 281: Result unnecessarily involves higher level functions.

$$\int F^{a+b(c+dx)^3} (c+dx)^{17} dx$$

Optimal (type 3, 105 leaves, 1 step):

$$\frac{1}{3 b^6 d \operatorname{Log}[F]^6} F^{a+b(c+dx)^3} \left(120 - 120 b (c+dx)^3 \operatorname{Log}[F] + 60 b^2 (c+dx)^6 \operatorname{Log}[F]^2 - 20 b^3 (c+dx)^9 \operatorname{Log}[F]^3 + 5 b^4 (c+dx)^{12} \operatorname{Log}[F]^4 - b^5 (c+dx)^{15} \operatorname{Log}[F]^5 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \text{Gamma}[6, -b (c + d x)^3 \text{Log}[F]]}{3 b^6 d \text{Log}[F]^6}$$

Problem 282: Result unnecessarily involves higher level functions.

$$\int F^{a+b (c+dx)^3} (c + d x)^{14} dx$$

Optimal (type 3, 88 leaves, 1 step):

$$\frac{1}{3 b^5 d \text{Log}[F]^5} F^{a+b (c+dx)^3} \left(24 - 24 b (c + d x)^3 \text{Log}[F] + 12 b^2 (c + d x)^6 \text{Log}[F]^2 - 4 b^3 (c + d x)^9 \text{Log}[F]^3 + b^4 (c + d x)^{12} \text{Log}[F]^4 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \text{Gamma}[5, -b (c + d x)^3 \text{Log}[F]]}{3 b^5 d \text{Log}[F]^5}$$

Problem 312: Result unnecessarily involves higher level functions.

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c + d x)^6} dx$$

Optimal (type 3, 92 leaves, 1 step):

$$-\frac{1}{b^5 d (c + d x)^4 \text{Log}[F]^5} F^{a+\frac{b}{c+dx}} \left(24 (c + d x)^4 - 24 b (c + d x)^3 \text{Log}[F] + 12 b^2 (c + d x)^2 \text{Log}[F]^2 - 4 b^3 (c + d x) \text{Log}[F]^3 + b^4 \text{Log}[F]^4 \right)$$

Result (type 4, 29 leaves, 1 step):

$$-\frac{F^a \text{Gamma}\left[5, -\frac{b \text{Log}[F]}{c+dx}\right]}{b^5 d \text{Log}[F]^5}$$

Problem 313: Result unnecessarily involves higher level functions.

$$\int \frac{F^{a+\frac{b}{c+dx}}}{(c + d x)^7} dx$$

Optimal (type 3, 108 leaves, 1 step):

$$\frac{1}{b^6 d (c + d x)^5 \operatorname{Log}[F]^6}$$

$$F^{a + \frac{b}{c+dx}} \left(120 (c + d x)^5 - 120 b (c + d x)^4 \operatorname{Log}[F] + 60 b^2 (c + d x)^3 \operatorname{Log}[F]^2 - 20 b^3 (c + d x)^2 \operatorname{Log}[F]^3 + 5 b^4 (c + d x) \operatorname{Log}[F]^4 - b^5 \operatorname{Log}[F]^5 \right)$$

Result (type 4, 28 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[6, -\frac{b \operatorname{Log}[F]}{c+dx}\right]}{b^6 d \operatorname{Log}[F]^6}$$

Problem 325: Result unnecessarily involves higher level functions.

$$\int \frac{F^{a + \frac{b}{(c+dx)^2}}}{(c + d x)^{11}} dx$$

Optimal (type 3, 96 leaves, 1 step):

$$-\frac{1}{2 b^5 d (c + d x)^8 \operatorname{Log}[F]^5} F^{a + \frac{b}{(c+dx)^2}} \left(24 (c + d x)^8 - 24 b (c + d x)^6 \operatorname{Log}[F] + 12 b^2 (c + d x)^4 \operatorname{Log}[F]^2 - 4 b^3 (c + d x)^2 \operatorname{Log}[F]^3 + b^4 \operatorname{Log}[F]^4 \right)$$

Result (type 4, 31 leaves, 1 step):

$$-\frac{F^a \operatorname{Gamma}\left[5, -\frac{b \operatorname{Log}[F]}{(c+dx)^2}\right]}{2 b^5 d \operatorname{Log}[F]^5}$$

Problem 326: Result unnecessarily involves higher level functions.

$$\int \frac{F^{a + \frac{b}{(c+dx)^2}}}{(c + d x)^{13}} dx$$

Optimal (type 3, 113 leaves, 1 step):

$$\frac{1}{2 b^6 d (c + d x)^{10} \operatorname{Log}[F]^6}$$

$$F^{a + \frac{b}{(c+dx)^2}} \left(120 (c + d x)^{10} - 120 b (c + d x)^8 \operatorname{Log}[F] + 60 b^2 (c + d x)^6 \operatorname{Log}[F]^2 - 20 b^3 (c + d x)^4 \operatorname{Log}[F]^3 + 5 b^4 (c + d x)^2 \operatorname{Log}[F]^4 - b^5 \operatorname{Log}[F]^5 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[6, -\frac{b \operatorname{Log}[F]}{(c+dx)^2}\right]}{2 b^6 d \operatorname{Log}[F]^6}$$

Problem 351: Result unnecessarily involves higher level functions.

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{16}} dx$$

Optimal (type 3, 96 leaves, 1 step):

$$-\frac{1}{3 b^5 d (c+dx)^{12} \operatorname{Log}[F]^5} F^{a+\frac{b}{(c+dx)^3}} \left(24 (c+dx)^{12} - 24 b (c+dx)^9 \operatorname{Log}[F] + 12 b^2 (c+dx)^6 \operatorname{Log}[F]^2 - 4 b^3 (c+dx)^3 \operatorname{Log}[F]^3 + b^4 \operatorname{Log}[F]^4 \right)$$

Result (type 4, 31 leaves, 1 step):

$$-\frac{F^a \operatorname{Gamma}\left[5, -\frac{b \operatorname{Log}[F]}{(c+dx)^3}\right]}{3 b^5 d \operatorname{Log}[F]^5}$$

Problem 352: Result unnecessarily involves higher level functions.

$$\int \frac{F^{a+\frac{b}{(c+dx)^3}}}{(c+dx)^{19}} dx$$

Optimal (type 3, 113 leaves, 1 step):

$$\frac{1}{3 b^6 d (c+dx)^{15} \operatorname{Log}[F]^6} F^{a+\frac{b}{(c+dx)^3}} \left(120 (c+dx)^{15} - 120 b (c+dx)^{12} \operatorname{Log}[F] + 60 b^2 (c+dx)^9 \operatorname{Log}[F]^2 - 20 b^3 (c+dx)^6 \operatorname{Log}[F]^3 + 5 b^4 (c+dx)^3 \operatorname{Log}[F]^4 - b^5 \operatorname{Log}[F]^5 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[6, -\frac{b \operatorname{Log}[F]}{(c+dx)^3}\right]}{3 b^6 d \operatorname{Log}[F]^6}$$

Problem 368: Result unnecessarily involves higher level functions.

$$\int F^{a+b(c+dx)^n} (c+dx)^{-1+6n} dx$$

Optimal (type 3, 114 leaves, 1 step):

$$\frac{1}{b^6 d n \operatorname{Log}[F]^6} F^{a+b (c+dx)^n} \left(120 - 120 b (c+dx)^n \operatorname{Log}[F] + 60 b^2 (c+dx)^{2n} \operatorname{Log}[F]^2 - 20 b^3 (c+dx)^{3n} \operatorname{Log}[F]^3 + 5 b^4 (c+dx)^{4n} \operatorname{Log}[F]^4 - b^5 (c+dx)^{5n} \operatorname{Log}[F]^5 \right)$$

Result (type 4, 32 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[6, -b (c+dx)^n \operatorname{Log}[F]\right]}{b^6 d n \operatorname{Log}[F]^6}$$

Problem 369: Result unnecessarily involves higher level functions.

$$\int F^{a+b (c+dx)^n} (c+dx)^{-1+5n} dx$$

Optimal (type 3, 94 leaves, 1 step):

$$\frac{1}{b^5 d n \operatorname{Log}[F]^5} F^{a+b (c+dx)^n} \left(24 - 24 b (c+dx)^n \operatorname{Log}[F] + 12 b^2 (c+dx)^{2n} \operatorname{Log}[F]^2 - 4 b^3 (c+dx)^{3n} \operatorname{Log}[F]^3 + b^4 (c+dx)^{4n} \operatorname{Log}[F]^4 \right)$$

Result (type 4, 31 leaves, 1 step):

$$\frac{F^a \operatorname{Gamma}\left[5, -b (c+dx)^n \operatorname{Log}[F]\right]}{b^5 d n \operatorname{Log}[F]^5}$$

Problem 586: Result optimal but 1 more steps used.

$$\int e^{\operatorname{Log}[(d+ex)^n]^2} (d+ex)^m dx$$

Optimal (type 4, 76 leaves, 3 steps):

$$\frac{e^{-\frac{(1+m)^2}{4n^2}} \sqrt{\pi} (d+ex)^{1+m} \left((d+ex)^n \right)^{-\frac{1+m}{n}} \operatorname{Erfi}\left[\frac{1+m+2n \operatorname{Log}[(d+ex)^n]}{2n}\right]}{2 e n}$$

Result (type 4, 76 leaves, 4 steps):

$$\frac{e^{-\frac{(1+m)^2}{4n^2}} \sqrt{\pi} (d+ex)^{1+m} \left((d+ex)^n \right)^{-\frac{1+m}{n}} \operatorname{Erfi}\left[\frac{1+m+2n \operatorname{Log}[(d+ex)^n]}{2n}\right]}{2 e n}$$

Problem 587: Result valid but suboptimal antiderivative.

$$\int F^{f (a+b \operatorname{Log}[c (d+ex)^n]^2)} (d g + e g x)^m dx$$

Optimal (type 4, 137 leaves, 3 steps):

$$\frac{e^{-\frac{(1+m)^2}{4bf n^2 \text{Log}[F]}} F^a f \sqrt{\pi} (c(d+ex)^n)^{-\frac{1+m}{n}} (dg+egx)^{1+m} \text{Erfi}\left[\frac{1+m+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} g n \sqrt{\text{Log}[F]}}$$

Result (type 4, 136 leaves, 4 steps):

$$\frac{e^{-\frac{(1+m)^2}{4bf n^2 \text{Log}[F]}} F^a f \sqrt{\pi} (g(d+ex))^{1+m} (c(d+ex)^n)^{-\frac{1+m}{n}} \text{Erfi}\left[\frac{1+m+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} g n \sqrt{\text{Log}[F]}}$$

Problem 588: Result optimal but 2 more steps used.

$$\int F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (dg+egx)^2 dx$$

Optimal (type 4, 123 leaves, 3 steps):

$$\frac{e^{-\frac{9}{4bf n^2 \text{Log}[F]}} F^a f g^2 \sqrt{\pi} (d+ex)^3 (c(d+ex)^n)^{-3/n} \text{Erfi}\left[\frac{3+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 4, 123 leaves, 5 steps):

$$\frac{e^{-\frac{9}{4bf n^2 \text{Log}[F]}} F^a f g^2 \sqrt{\pi} (d+ex)^3 (c(d+ex)^n)^{-3/n} \text{Erfi}\left[\frac{3+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 589: Result optimal but 2 more steps used.

$$\int F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (dg+egx) dx$$

Optimal (type 4, 115 leaves, 3 steps):

$$\frac{e^{-\frac{1}{bf n^2 \text{Log}[F]}} F^a f g \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \text{Erfi}\left[\frac{1+bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 4, 115 leaves, 5 steps):

$$\frac{e^{-\frac{1}{bfn^2 \text{Log}[F]}} F^{af} g \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \text{Erfi}\left[\frac{1+bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2 \sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 590: Result optimal but 1 more steps used.

$$\int F^{f(a+b \text{Log}[c(d+ex)^n]^2)} dx$$

Optimal (type 4, 118 leaves, 3 steps):

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{1+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2 \sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 4, 118 leaves, 4 steps):

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{1+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2 \sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 591: Result optimal but 2 more steps used.

$$\int \frac{F^{f(a+b \text{Log}[c(d+ex)^n]^2)}}{dg+egx} dx$$

Optimal (type 4, 67 leaves, 2 steps):

$$\frac{F^{af} \sqrt{\pi} \text{Erfi}\left[\sqrt{b} \sqrt{f} \sqrt{\text{Log}[F]} \text{Log}[c(d+ex)^n]\right]}{2 \sqrt{b} e \sqrt{f} g n \sqrt{\text{Log}[F]}}$$

Result (type 4, 67 leaves, 4 steps):

$$\frac{F^{af} \sqrt{\pi} \text{Erfi}\left[\sqrt{b} \sqrt{f} \sqrt{\text{Log}[F]} \text{Log}[c(d+ex)^n]\right]}{2 \sqrt{b} e \sqrt{f} g n \sqrt{\text{Log}[F]}}$$

Problem 592: Result optimal but 2 more steps used.

$$\int \frac{F^{f(a+b \text{Log}[c(d+ex)^n]^2)}}{(dg+egx)^2} dx$$

Optimal (type 4, 121 leaves, 3 steps):

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} \sqrt{\pi} (c(d+ex)^n)^{\frac{1}{n}} \text{Erfi}\left[\frac{1-2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^{\sqrt{f}} g^2 n (d+ex) \sqrt{\text{Log}[F]}}$$

Result (type 4, 121 leaves, 5 steps):

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} \sqrt{\pi} (c(d+ex)^n)^{\frac{1}{n}} \text{Erfi}\left[\frac{1-2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^{\sqrt{f}} g^2 n (d+ex) \sqrt{\text{Log}[F]}}$$

Problem 593: Result optimal but 2 more steps used.

$$\int \frac{F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (dg+ex)^3 dx$$

Optimal (type 4, 118 leaves, 3 steps):

$$\frac{e^{-\frac{1}{bf n^2 \text{Log}[F]}} F^{af} \sqrt{\pi} (c(d+ex)^n)^{2/n} \text{Erfi}\left[\frac{1-bfn \text{Log}[F] \text{Log}[c(d+ex)^n]}{\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^{\sqrt{f}} g^3 n (d+ex)^2 \sqrt{\text{Log}[F]}}$$

Result (type 4, 118 leaves, 5 steps):

$$\frac{e^{-\frac{1}{bf n^2 \text{Log}[F]}} F^{af} \sqrt{\pi} (c(d+ex)^n)^{2/n} \text{Erfi}\left[\frac{1-bfn \text{Log}[F] \text{Log}[c(d+ex)^n]}{\sqrt{b}\sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^{\sqrt{f}} g^3 n (d+ex)^2 \sqrt{\text{Log}[F]}}$$

Problem 594: Result valid but suboptimal antiderivative.

$$\int F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (g+hx)^m dx$$

Optimal (type 8, 30 leaves, 0 steps):

Unintegrable $[F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (g+hx)^m, x]$

Result (type 8, 30 leaves, 0 steps):

CannotIntegrate $[F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (g+hx)^m, x]$

Problem 595: Unable to integrate problem.

$$\int F^{f(a+b \operatorname{Log}[c(d+ex)^n]^2)} (g+hx)^3 dx$$

Optimal (type 4, 502 leaves, 14 steps):

$$\frac{3 e^{-\frac{1}{bf n^2 \operatorname{Log}[F]}} F^{af} h (eg-dh)^2 \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \operatorname{Erfi}\left[\frac{1+bf n \operatorname{Log}[F] \operatorname{Log}[c(d+ex)^n]}{\sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} +$$

$$\frac{e^{-\frac{4}{bf n^2 \operatorname{Log}[F]}} F^{af} h^3 \sqrt{\pi} (d+ex)^4 (c(d+ex)^n)^{-4/n} \operatorname{Erfi}\left[\frac{2+bf n \operatorname{Log}[F] \operatorname{Log}[c(d+ex)^n]}{\sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} +$$

$$\frac{e^{-\frac{1}{4bf n^2 \operatorname{Log}[F]}} F^{af} (eg-dh)^3 \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \operatorname{Erfi}\left[\frac{1+2bf n \operatorname{Log}[F] \operatorname{Log}[c(d+ex)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} +$$

$$\frac{3 e^{-\frac{9}{4bf n^2 \operatorname{Log}[F]}} F^{af} h^2 (eg-dh) \sqrt{\pi} (d+ex)^3 (c(d+ex)^n)^{-3/n} \operatorname{Erfi}\left[\frac{3+2bf n \operatorname{Log}[F] \operatorname{Log}[c(d+ex)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}}$$

Result (type 8, 214 leaves, 6 steps):

$$3 g^2 h \operatorname{CannotIntegrate}\left[F^{f(a+b \operatorname{Log}[c(d+ex)^n]^2)} x, x\right] + 3 g h^2 \operatorname{CannotIntegrate}\left[F^{f(a+b \operatorname{Log}[c(d+ex)^n]^2)} x^2, x\right] +$$

$$h^3 \operatorname{CannotIntegrate}\left[F^{f(a+b \operatorname{Log}[c(d+ex)^n]^2)} x^3, x\right] + \frac{e^{-\frac{1}{4bf n^2 \operatorname{Log}[F]}} F^{af} g^3 \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \operatorname{Erfi}\left[\frac{1+2bf n \operatorname{Log}[F] \operatorname{Log}[c(d+ex)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}}$$

Problem 596: Unable to integrate problem.

$$\int F^{f(a+b \operatorname{Log}[c(d+ex)^n]^2)} (g+hx)^2 dx$$

Optimal (type 4, 372 leaves, 11 steps):

$$\frac{e^{-\frac{1}{bfn^2 \text{Log}[F]}} F^{af} h (eg - dh) \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \text{Erfi}\left[\frac{1+bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{\sqrt{b} e^3 \sqrt{f} n \sqrt{\text{Log}[F]}} +$$

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} (eg - dh)^2 \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{1+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^3 \sqrt{f} n \sqrt{\text{Log}[F]}} +$$

$$\frac{e^{-\frac{9}{4bf n^2 \text{Log}[F]}} F^{af} h^2 \sqrt{\pi} (d+ex)^3 (c(d+ex)^n)^{-3/n} \text{Erfi}\left[\frac{3+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^3 \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 8, 180 leaves, 6 steps):

$$2gh \text{CannotIntegrate}\left[F^{f(a+b \text{Log}[c(d+ex)^n]^2)} x, x\right] + h^2 \text{CannotIntegrate}\left[F^{f(a+b \text{Log}[c(d+ex)^n]^2)} x^2, x\right] +$$

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} g^2 \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{1+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 597: Unable to integrate problem.

$$\int F^{f(a+b \text{Log}[c(d+ex)^n]^2)} (g+hx) dx$$

Optimal (type 4, 242 leaves, 8 steps):

$$\frac{e^{-\frac{1}{bf n^2 \text{Log}[F]}} F^{af} h \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \text{Erfi}\left[\frac{1+bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^2 \sqrt{f} n \sqrt{\text{Log}[F]}} +$$

$$\frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} (eg - dh) \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{1+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e^2 \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 8, 146 leaves, 6 steps):

$$h \text{CannotIntegrate}\left[F^{f(a+b \text{Log}[c(d+ex)^n]^2)} x, x\right] + \frac{e^{-\frac{1}{4bf n^2 \text{Log}[F]}} F^{af} g \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{1+2bf n \text{Log}[F] \text{Log}[c(d+ex)^n]}{2\sqrt{b} \sqrt{f} n \sqrt{\text{Log}[F]}}\right]}{2\sqrt{b} e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 598: Result optimal but 1 more steps used.

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

Optimal (type 4, 118 leaves, 3 steps):

$$\frac{e^{-\frac{1}{4 b f n^2 \operatorname{Log}[F]}} F^{a f} \sqrt{\pi} (d+e x) (c (d+e x)^n)^{-1/n} \operatorname{Erfi}\left[\frac{1+2 b f n \operatorname{Log}[F] \operatorname{Log}[c (d+e x)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e \sqrt{f} n \sqrt{\operatorname{Log}[F]}}$$

Result (type 4, 118 leaves, 4 steps):

$$\frac{e^{-\frac{1}{4 b f n^2 \operatorname{Log}[F]}} F^{a f} \sqrt{\pi} (d+e x) (c (d+e x)^n)^{-1/n} \operatorname{Erfi}\left[\frac{1+2 b f n \operatorname{Log}[F] \operatorname{Log}[c (d+e x)^n]}{2 \sqrt{b} \sqrt{f} n \sqrt{\operatorname{Log}[F]}}\right]}{2 \sqrt{b} e \sqrt{f} n \sqrt{\operatorname{Log}[F]}}$$

Problem 599: Result valid but suboptimal antiderivative.

$$\int \frac{F^{f (a+b \operatorname{Log}[c (d+e x)^n]^2)}}{g+h x} dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\operatorname{Unintegrable}\left[\frac{F^{f (a+b \operatorname{Log}[c (d+e x)^n]^2)}}{g+h x}, x\right]$$

Result (type 8, 30 leaves, 0 steps):

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

Problem 600: Result valid but suboptimal antiderivative.

$$\int \frac{F^{f (a+b \operatorname{Log}[c (d+e x)^n]^2)}}{(g+h x)^2} dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\operatorname{Unintegrable}\left[\frac{F^{f (a+b \operatorname{Log}[c (d+e x)^n]^2)}}{(g+h x)^2}, x\right]$$

Result (type 8, 30 leaves, 0 steps):

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

Problem 601: Result valid but suboptimal antiderivative.

$$\int \frac{F^{f(a+b\text{Log}[c(d+ex)^n]^2)}}{(g+hx)^3} dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{F^{f(a+b\text{Log}[c(d+ex)^n]^2)}}{(g+hx)^3}, x\right]$$

Result (type 8, 30 leaves, 0 steps):

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

Problem 602: Result valid but suboptimal antiderivative.

$$\int F^{f(a+b\text{Log}[c(d+ex)^n]^2)} (dg+egx)^m dx$$

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

$$\frac{1}{2be\sqrt{f}n\sqrt{\text{Log}[F]}} e^{-\frac{(1+m+2abfn\text{Log}[F])^2}{4b^2fn^2\text{Log}[F]}} F^{a^2f\sqrt{\pi}} (d+ex) (c(d+ex)^n)^{-\frac{1+m}{n}} (dg+egx)^m \text{Erfi}\left[\frac{1+m+2abfn\text{Log}[F]+2b^2fn\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}n\sqrt{\text{Log}[F]}}\right]$$

Result (type 4, 152 leaves, 8 steps):

$$\frac{1}{2be\sqrt{f}n\sqrt{\text{Log}[F]}} e^{-\frac{(1+m+2abfn\text{Log}[F])^2}{4b^2fn^2\text{Log}[F]}} F^{a^2f\sqrt{\pi}} (d+ex) (g(d+ex))^m (c(d+ex)^n)^{-\frac{1+m}{n}} \text{Erfi}\left[\frac{1+m+2abfn\text{Log}[F]+2b^2fn\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}n\sqrt{\text{Log}[F]}}\right]$$

Problem 603: Result optimal but 4 more steps used.

$$\int F^{f(a+b\text{Log}[c(d+ex)^n]^2)} (dg+egx)^2 dx$$

Optimal (type 4, 133 leaves, 4 steps):

$$\frac{e^{-\frac{3(3+4abfn\text{Log}[F])}{4b^2fn^2\text{Log}[F]}} g^2 \sqrt{\pi} (d+ex)^3 (c(d+ex)^n)^{-3/n} \text{Erfi}\left[\frac{\frac{3}{n}+2abf\text{Log}[F]+2b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Result (type 4, 133 leaves, 8 steps):

$$\frac{e^{-\frac{3(3+4abfn\text{Log}[F])}{4b^2fn^2\text{Log}[F]}} g^2 \sqrt{\pi} (d+ex)^3 (c(d+ex)^n)^{-3/n} \text{Erfi}\left[\frac{\frac{3}{n}+2abf\text{Log}[F]+2b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Problem 604: Result optimal but 4 more steps used.

$$\int F^f (a+b\text{Log}[c(d+ex)^n])^2 (dg+ex) dx$$

Optimal (type 4, 122 leaves, 4 steps):

$$\frac{e^{-\frac{1+2abfn\text{Log}[F]}{b^2fn^2\text{Log}[F]}} g \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \text{Erfi}\left[\frac{\frac{1}{n}+abf\text{Log}[F]+b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Result (type 4, 122 leaves, 8 steps):

$$\frac{e^{-\frac{1+2abfn\text{Log}[F]}{b^2fn^2\text{Log}[F]}} g \sqrt{\pi} (d+ex)^2 (c(d+ex)^n)^{-2/n} \text{Erfi}\left[\frac{\frac{1}{n}+abf\text{Log}[F]+b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Problem 605: Result optimal but 3 more steps used.

$$\int F^f (a+b\text{Log}[c(d+ex)^n])^2 dx$$

Optimal (type 4, 126 leaves, 4 steps):

$$\frac{e^{-\frac{1+4abfn\text{Log}[F]}{4b^2fn^2\text{Log}[F]}} \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{\frac{1}{n}+2abf\text{Log}[F]+2b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Result (type 4, 126 leaves, 7 steps):

$$\frac{e^{-\frac{1+4abfn\text{Log}[F]}{4b^2fn^2\text{Log}[F]}} \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{\frac{1}{n}+2abf\text{Log}[F]+2b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Problem 606: Result optimal but 4 more steps used.

$$\int \frac{F^f (a+b \operatorname{Log}[c (d+e x)^n])^2}{d g + e g x} dx$$

Optimal (type 4, 70 leaves, 4 steps):

$$\frac{\sqrt{\pi} \operatorname{Erfi}\left[a \sqrt{f} \sqrt{\operatorname{Log}[F]} + b \sqrt{f} \sqrt{\operatorname{Log}[F]} \operatorname{Log}[c (d+e x)^n]\right]}{2 b e \sqrt{f} g n \sqrt{\operatorname{Log}[F]}}$$

Result (type 4, 70 leaves, 8 steps):

$$\frac{\sqrt{\pi} \operatorname{Erfi}\left[a \sqrt{f} \sqrt{\operatorname{Log}[F]} + b \sqrt{f} \sqrt{\operatorname{Log}[F]} \operatorname{Log}[c (d+e x)^n]\right]}{2 b e \sqrt{f} g n \sqrt{\operatorname{Log}[F]}}$$

Problem 607: Result optimal but 4 more steps used.

$$\int \frac{F^f (a+b \operatorname{Log}[c (d+e x)^n])^2}{(d g + e g x)^2} dx$$

Optimal (type 4, 128 leaves, 4 steps):

$$\frac{e^{\frac{a}{b n} - \frac{1}{4 b^2 f n^2 \operatorname{Log}[F]}} \sqrt{\pi} (c (d+e x)^n)^{\frac{1}{n}} \operatorname{Erfi}\left[\frac{\frac{1}{n} - 2 a b f \operatorname{Log}[F] - 2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c (d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e \sqrt{f} g^2 n (d+e x) \sqrt{\operatorname{Log}[F]}}$$

Result (type 4, 128 leaves, 8 steps):

$$\frac{e^{\frac{a}{b n} - \frac{1}{4 b^2 f n^2 \operatorname{Log}[F]}} \sqrt{\pi} (c (d+e x)^n)^{\frac{1}{n}} \operatorname{Erfi}\left[\frac{\frac{1}{n} - 2 a b f \operatorname{Log}[F] - 2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c (d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e \sqrt{f} g^2 n (d+e x) \sqrt{\operatorname{Log}[F]}}$$

Problem 608: Result optimal but 4 more steps used.

$$\int \frac{F^f (a+b \operatorname{Log}[c (d+e x)^n])^2}{(d g + e g x)^3} dx$$

Optimal (type 4, 126 leaves, 4 steps):

$$\frac{e^{-\frac{1-2abfn\text{Log}[F]}{b^2fn^2\text{Log}[F]}} \sqrt{\pi} (c(d+ex)^n)^{2/n} \text{Erfi}\left[\frac{\frac{1}{n}abf\text{Log}[F]-b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}g^3n(d+ex)^2\sqrt{\text{Log}[F]}}$$

Result (type 4, 126 leaves, 8 steps):

$$\frac{e^{-\frac{1-2abfn\text{Log}[F]}{b^2fn^2\text{Log}[F]}} \sqrt{\pi} (c(d+ex)^n)^{2/n} \text{Erfi}\left[\frac{\frac{1}{n}abf\text{Log}[F]-b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}g^3n(d+ex)^2\sqrt{\text{Log}[F]}}$$

Problem 609: Result valid but suboptimal antiderivative.

$$\int F^{f(a+b\text{Log}[c(d+ex)^n])^2} (g+hx)^m dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\text{Unintegrable}\left[F^{f(a+b\text{Log}[c(d+ex)^n])^2} (g+hx)^m, x\right]$$

Result (type 8, 30 leaves, 0 steps):

$$\text{CannotIntegrate}\left[F^{f(a+b\text{Log}[c(d+ex)^n])^2} (g+hx)^m, x\right]$$

Problem 610: Unable to integrate problem.

$$\int F^{f(a+b\text{Log}[c(d+ex)^n])^2} (g+hx)^3 dx$$

Optimal (type 4, 535 leaves, 18 steps):

$$\begin{aligned}
& \frac{3 e^{-\frac{1+2 a b f n \operatorname{Log}[F]}{b^2 f n^2 \operatorname{Log}[F]}} h (e g-d h)^2 \sqrt{\pi} (d+e x)^2 (c(d+e x)^n)^{-2/n} \operatorname{Erfi}\left[\frac{\frac{1}{n}+a b f \operatorname{Log}[F]+b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} + \\
& \frac{e^{-\frac{4(1-a b f n \operatorname{Log}[F])}{b^2 f n^2 \operatorname{Log}[F]}} h^3 \sqrt{\pi} (d+e x)^4 (c(d+e x)^n)^{-4/n} \operatorname{Erfi}\left[\frac{\frac{2}{n}+a b f \operatorname{Log}[F]+b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} + \\
& \frac{e^{-\frac{1-4 a b f n \operatorname{Log}[F]}{4 b^2 f n^2 \operatorname{Log}[F]}} (e g-d h)^3 \sqrt{\pi} (d+e x) (c(d+e x)^n)^{-1/n} \operatorname{Erfi}\left[\frac{\frac{1}{n}+2 a b f \operatorname{Log}[F]+2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} + \frac{1}{2 b e^4 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} \\
& 3 e^{-\frac{3(3-4 a b f n \operatorname{Log}[F])}{4 b^2 f n^2 \operatorname{Log}[F]}} h^2 (e g-d h) \sqrt{\pi} (d+e x)^3 (c(d+e x)^n)^{-3/n} \operatorname{Erfi}\left[\frac{\frac{3}{n}+2 a b f \operatorname{Log}[F]+2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}
\end{aligned}$$

Result (type 8, 222 leaves, 9 steps):

$$\begin{aligned}
& 3 g^2 h \operatorname{CannotIntegrate}\left[F^{f(a+b \operatorname{Log}[c(d+e x)^n])^2} x, x\right] + 3 g h^2 \operatorname{CannotIntegrate}\left[F^{f(a+b \operatorname{Log}[c(d+e x)^n])^2} x^2, x\right] + \\
& h^3 \operatorname{CannotIntegrate}\left[F^{f(a+b \operatorname{Log}[c(d+e x)^n])^2} x^3, x\right] + \frac{e^{-\frac{1-4 a b f n \operatorname{Log}[F]}{4 b^2 f n^2 \operatorname{Log}[F]}} g^3 \sqrt{\pi} (d+e x) (c(d+e x)^n)^{-1/n} \operatorname{Erfi}\left[\frac{\frac{1}{n}+2 a b f \operatorname{Log}[F]+2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e \sqrt{f} n \sqrt{\operatorname{Log}[F]}}
\end{aligned}$$

Problem 611: Unable to integrate problem.

$$\int F^{f(a+b \operatorname{Log}[c(d+e x)^n])^2} (g+h x)^2 dx$$

Optimal (type 4, 397 leaves, 14 steps):

$$\begin{aligned}
& \frac{e^{-\frac{1+2 a b f n \operatorname{Log}[F]}{b^2 f n^2 \operatorname{Log}[F]}} h (e g-d h) \sqrt{\pi} (d+e x)^2 (c(d+e x)^n)^{-2/n} \operatorname{Erfi}\left[\frac{\frac{1}{n}+a b f \operatorname{Log}[F]+b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{b e^3 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} + \\
& \frac{e^{-\frac{1-4 a b f n \operatorname{Log}[F]}{4 b^2 f n^2 \operatorname{Log}[F]}} (e g-d h)^2 \sqrt{\pi} (d+e x) (c(d+e x)^n)^{-1/n} \operatorname{Erfi}\left[\frac{\frac{1}{n}+2 a b f \operatorname{Log}[F]+2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e^3 \sqrt{f} n \sqrt{\operatorname{Log}[F]}} + \\
& \frac{e^{-\frac{3(3+4 a b f n \operatorname{Log}[F])}{4 b^2 f n^2 \operatorname{Log}[F]}} h^2 \sqrt{\pi} (d+e x)^3 (c(d+e x)^n)^{-3/n} \operatorname{Erfi}\left[\frac{\frac{3}{n}+2 a b f \operatorname{Log}[F]+2 b^2 f \operatorname{Log}[F] \operatorname{Log}[c(d+e x)^n]}{2 b \sqrt{f} \sqrt{\operatorname{Log}[F]}}\right]}{2 b e^3 \sqrt{f} n \sqrt{\operatorname{Log}[F]}}
\end{aligned}$$

Result (type 8, 188 leaves, 9 steps):

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

$$\frac{e^{-\frac{1+4 a b f n \text{Log}[F]}{4 b^2 f n^2 \text{Log}[F]}} g^2 \sqrt{\pi} (d+e x) (c (d+e x)^n)^{-1/n} \text{Erfi} \left[\frac{\frac{1}{n}+2 a b f \text{Log}[F]+2 b^2 f \text{Log}[F] \text{Log}[c (d+e x)^n]}{2 b \sqrt{f} \sqrt{\text{Log}[F]}} \right]}{2 b e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 612: Unable to integrate problem.

$$\int F^{f (a+b \text{Log}[c (d+e x)^n])^2} (g+h x) dx$$

Optimal (type 4, 257 leaves, 10 steps):

$$\frac{e^{-\frac{1+2 a b f n \text{Log}[F]}{b^2 f n^2 \text{Log}[F]}} h \sqrt{\pi} (d+e x)^2 (c (d+e x)^n)^{-2/n} \text{Erfi} \left[\frac{\frac{1}{n}+a b f \text{Log}[F]+b^2 f \text{Log}[F] \text{Log}[c (d+e x)^n]}{b \sqrt{f} \sqrt{\text{Log}[F]}} \right]}{2 b e^2 \sqrt{f} n \sqrt{\text{Log}[F]}} +$$

$$\frac{e^{-\frac{1+4 a b f n \text{Log}[F]}{4 b^2 f n^2 \text{Log}[F]}} (e g-d h) \sqrt{\pi} (d+e x) (c (d+e x)^n)^{-1/n} \text{Erfi} \left[\frac{\frac{1}{n}+2 a b f \text{Log}[F]+2 b^2 f \text{Log}[F] \text{Log}[c (d+e x)^n]}{2 b \sqrt{f} \sqrt{\text{Log}[F]}} \right]}{2 b e^2 \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 8, 154 leaves, 9 steps):

$$h \text{ CannotIntegrate} \left[F^{f (a+b \text{Log}[c (d+e x)^n])^2} x, x \right] + \frac{e^{-\frac{1+4 a b f n \text{Log}[F]}{4 b^2 f n^2 \text{Log}[F]}} g \sqrt{\pi} (d+e x) (c (d+e x)^n)^{-1/n} \text{Erfi} \left[\frac{\frac{1}{n}+2 a b f \text{Log}[F]+2 b^2 f \text{Log}[F] \text{Log}[c (d+e x)^n]}{2 b \sqrt{f} \sqrt{\text{Log}[F]}} \right]}{2 b e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Problem 613: Result optimal but 3 more steps used.

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

Optimal (type 4, 126 leaves, 4 steps):

$$\frac{e^{-\frac{1+4 a b f n \text{Log}[F]}{4 b^2 f n^2 \text{Log}[F]}} \sqrt{\pi} (d+e x) (c (d+e x)^n)^{-1/n} \text{Erfi} \left[\frac{\frac{1}{n}+2 a b f \text{Log}[F]+2 b^2 f \text{Log}[F] \text{Log}[c (d+e x)^n]}{2 b \sqrt{f} \sqrt{\text{Log}[F]}} \right]}{2 b e \sqrt{f} n \sqrt{\text{Log}[F]}}$$

Result (type 4, 126 leaves, 7 steps):

$$\frac{e^{-\frac{1-4abfn\text{Log}[F]}{4b^2fn^2\text{Log}[F]}} \sqrt{\pi} (d+ex) (c(d+ex)^n)^{-1/n} \text{Erfi}\left[\frac{\frac{1}{n}+2abf\text{Log}[F]+2b^2f\text{Log}[F]\text{Log}[c(d+ex)^n]}{2b\sqrt{f}\sqrt{\text{Log}[F]}}\right]}{2be\sqrt{f}n\sqrt{\text{Log}[F]}}$$

Problem 614: Result valid but suboptimal antiderivative.

$$\int \frac{F^{f(a+b\text{Log}[c(d+ex)^n])^2}}{g+hx} dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{F^{f(a+b\text{Log}[c(d+ex)^n])^2}}{g+hx}, x\right]$$

Result (type 8, 30 leaves, 0 steps):

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

Problem 615: Result valid but suboptimal antiderivative.

$$\int \frac{F^{f(a+b\text{Log}[c(d+ex)^n])^2}}{(g+hx)^2} dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{F^{f(a+b\text{Log}[c(d+ex)^n])^2}}{(g+hx)^2}, x\right]$$

Result (type 8, 30 leaves, 0 steps):

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

Problem 616: Result valid but suboptimal antiderivative.

$$\int \frac{F^{f(a+b\text{Log}[c(d+ex)^n])^2}}{(g+hx)^3} dx$$

Optimal (type 8, 30 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{F^f(a+b \text{Log}[c(d+e x)^n])^2}{(g+hx)^3}, x\right]$$

Result (type 8, 30 leaves, 0 steps):

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

Problem 692: Unable to integrate problem.

$$\int e^{x^x} x^{2x} (1 + \text{Log}[x]) dx$$

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

$$e^{x^x} (-1 + x^x)$$

Result (type 8, 29 leaves, 2 steps):

$$\text{CannotIntegrate}[e^{x^x} x^{2x}, x] + \text{CannotIntegrate}[e^{x^x} x^{2x} \text{Log}[x], x]$$

Problem 694: Unable to integrate problem.

$$\int x^{-2-\frac{1}{x}} (1 - \text{Log}[x]) dx$$

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

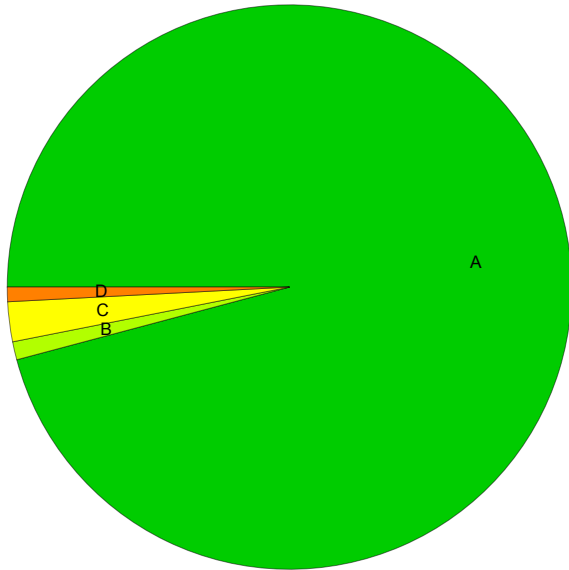
$$-x^{-1/x}$$

Result (type 8, 28 leaves, 2 steps):

$$\text{CannotIntegrate}[x^{-2-\frac{1}{x}}, x] - \text{CannotIntegrate}[x^{-2-\frac{1}{x}} \text{Log}[x], x]$$

Summary of Integration Test Results

965 integration problems



A - 925 optimal antiderivatives

B - 10 valid but suboptimal antiderivatives

C - 22 unnecessarily complex antiderivatives

D - 8 unable to integrate problems

E - 0 integration timeouts

F - 0 invalid antiderivatives