

FORMULA 4.262.9

$$\int_0^1 \frac{1-x^{2n+2}}{(1-x^2)^2} \ln^3 x \, dx = -\frac{(n+1)\pi^4}{16} + 6 \sum_{k=1}^n \frac{n-k+1}{(2k-1)^4}$$