

FORMULA 4.262.4

$$\int_0^1 \frac{x^n \ln^3 x}{1+x} dx = (-1)^{n+1} \left(\frac{7\pi^4}{120} - 6 \sum_{k=0}^{n-1} \frac{(-1)^k}{(k+1)^4} \right)$$