

FORMULA 4.262.8

$$\int_0^1 \ln^3 x \frac{1 + (-1)^n x^{n+1}}{(1+x)^2} dx = -\frac{7(n+1)\pi^4}{120} + 6 \sum_{k=1}^n (-1)^{k-1} \frac{n-k+1}{k^4}$$