

PROOF OF FORMULA 4.231.15

$$\int_0^1 \frac{x \ln x}{1-x^2} dx = -\frac{\pi^2}{24}$$

Let $t = x^2$. Then

$$\int_0^1 \frac{x \ln x}{1-x^2} dx = \frac{1}{4} \int_0^1 \frac{\ln t}{1-t} dt.$$

The second integral is evaluated as $-\pi^2/6$ in 4.231.2.