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**.