PROOF OF FORMULA 4.291.5

$$\int_0^1 \ln\left(\frac{1+x}{2}\right)\frac{dx}{1-x} = \frac{1}{2}\ln^2 2 - \frac{\pi^2}{12}$$

Let $x = 1 - 2t$ to obtain

$$\int_0^1 \ln\left(\frac{1+x}{2}\right)\frac{dx}{1-x} = \int_0^{1/2} \ln(1-t)\frac{dt}{t}.$$

The result follows from 4.291.3.