PROOF OF FORMULA 4.267.5

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

In entry 4.267.4 it is shown that

$$\int_0^1 \frac{(1-x)x^a}{(1+x)(1+x^2)} \frac{dx}{\ln x} = -\ln\Gamma(a) + 3\ln\Gamma\left(\frac{a}{2}\right) - 2\ln\Gamma\left(\frac{a}{4}\right) + \frac{\ln 2}{2}(a+1).$$

This entry corresponds to the special case $a = 2$.