PROOF OF FORMULA 4.295.5

$$\int_0^1 \frac{\ln(1+x^2)}{1+x^2}\, dx = \frac{\pi}{2}\ln 2 - G$$

Entry 4.224.2 states that
$$\int_0^{\pi/4} \ln\sin t\, dt = -\frac{\pi}{4}\ln 2 - \frac{G}{2}.$$
The change of variables $x = \tan t$ gives
$$\int_0^{\pi/4} \ln\sin t\, dt = \int_0^1 \frac{\ln x\, dx}{1+x^2} - \frac{1}{2}\int_0^1 \frac{\ln(1+x^2)}{1+x^2}\, dx.$$
Entry 4.232.11 is
$$\int_0^1 \frac{\ln x\, dx}{1+x^2} = -G$$
and this gives the result.