PROOF OF FORMULA 4.227.13

$$\int_0^{\pi/4} \ln(1 + \cot x)\, dx = \frac{\pi}{8}\ln 2 + G$$

Write the integral as

$$\int_0^{\pi/4} \ln(1 + \cot x)\, dx = \int_0^{\pi/4} \ln(\sin x + \cos x)\, dx - \int_0^{\pi/4} \ln \sin x \, dx.$$

The result now follows from entries **4.225.2** and **4.224.2** that give

$$\int_0^{\pi/4} \ln(\sin x + \cos x)\, dx = -\frac{\pi}{8}\ln 2 + \frac{G}{2}$$

and

$$\int_0^{\pi/4} \ln \sin x \, dx = -\frac{\pi}{4}\ln 2 - \frac{G}{2},$$

respectively.