PROOF OF FORMULA 4.227.14

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

Write the integral as

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

The result now follows from

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

and

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

given as entries 4.225.1 and 4.224.2 respectively.