PROOF OF FORMULA 4.227.7

$$\int_0^{\pi/4} \ln^2 \tan x \, dx = \frac{\pi^3}{16}$$

Entry **4.227.4** states that

$$\int_0^{\pi/4} \ln^n \tan x \, dx = \frac{1}{2} \left(\frac{\pi}{2}\right)^{n+1} |E_n|$$

for even n. Use the fact that $|E_2| = 1$ to obtain the result.