PROOF OF FORMULA 4.227.8

$$\int_0^{\pi/4} \ln^4 \tan x \, dx = \frac{5\pi^5}{64}$$

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 $|E_4| = 5$ to obtain the result.