

PROOF OF FORMULA 4.227.1

$$\int_0^u \ln \tan x \, dx = L(u) + L\left(\frac{\pi}{2} - u\right) - L\left(\frac{\pi}{2}\right)$$

$$\begin{aligned} \int_0^u \ln \tan x \, dx &= \int_0^u \ln \sin x \, dx - \int_0^u \ln \cos x \, dx \\ &= L\left(\frac{\pi}{2} - u\right) - L\left(\frac{\pi}{2}\right) - [-L(u)] \end{aligned}$$

according to **4.224.1** and **4.224.4**.