

PROOF OF FORMULA 3.681.2

$$\int_0^{\pi/4} \frac{(\tan x)^\mu - (\tan x)^{1-\mu}}{\cos x - \sin x} \frac{dx}{\sin x} = \pi \cot(\pi\mu)$$

Entry **3.688.1** states that

$$\int_0^{\pi/4} \frac{(\tan x)^\nu - (\tan x)^\mu}{\cos x - \sin x} \frac{dx}{\sin x} = \psi(\mu) - \psi(\nu).$$

Then, with $\nu = 1 - \mu$, the current integral has the value

$$\psi(1 - \mu) - \psi(\mu) = \pi \cot(\pi\mu),$$

that appears as entry **8.365.8**. This is the result.