

### 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.