PROOF OF FORMULA 3.411.27

$$\int_0^\infty \frac{1 - e^{-\mu x}}{1 + e^x} \frac{dx}{x} = \ln\left(\frac{\Gamma(\frac{\mu}{2} + 1)}{\Gamma(\frac{\mu+1}{2})} \sqrt{\pi}\right)$$

Write the integral as

$$\int_0^\infty \frac{1 - e^{-\mu x}}{1 + e^x} \frac{dx}{x} = \int_0^\infty \frac{e^{-x} - e^{-(\mu+1)x}}{e^{-x} + 1} \frac{dx}{x}$$

and this is a special case of entry **3.411.28**.