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.