PROOF OF FORMULA 3.411.25

$$\int_0^\infty x \frac{1 + e^{-x}}{e^x - 1}\, dx = \frac{\pi^2}{3} - 1$$

The change of variables $t = e^{-x}$ gives

$$\int_0^\infty x \frac{1 + e^{-x}}{e^x - 1}\, dx = -\int_0^1 \ln t \, \frac{1 + t}{1 - t}\, dt.$$

This integral is evaluated in entry **4.231.4** with value $\pi^2/3 - 1$.