PROOF OF FORMULA 3.435.1

\[ \int_{0}^{\infty} \frac{(x+1)e^{-x} - e^{-x/2}}{x} \, dx = 1 - \ln 2 \]

The integral is written as

\[ \int_{0}^{\infty} \frac{(x+1)e^{-x} - e^{-x/2}}{x} \, dx = \int_{0}^{\infty} e^{-x} \, dx + \int_{0}^{\infty} \frac{e^{-x} - e^{-x/2}}{x} \, dx. \]

The first integral is 1 and the second one is evaluated as \(-\ln 2\) in 3.434.2