

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 $\ln \frac{1}{2}$ in 3.434.2.