PROOF OF FORMULA 3.466.3

$$\int_0^1 \frac{e^{x^2}-1}{x^2}dx = \sum_{k=1}^{\infty} \frac{1}{(2k-1)\,k!}$$

Expand the integrand as

$$\sum_{k=1}^{\infty} \frac{x^{2k-2}}{k!}$$

and integrate term by term.

Mathematica gives $1 - e + \sqrt{\pi}\text{erfi}(1)$ for the value of the series. This is the *imaginary error function* defined by $\text{erf}(iz)/i$.