

**PROOF OF FORMULA 3.553.2**

$$\int_0^{\infty} \frac{\sinh^2(x/2)}{\cosh x} \frac{e^{-x}}{x} dx = \frac{1}{2} \ln \left( \frac{4}{\pi} \right)$$

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

$$\int_0^{\infty} \frac{\sinh^2(x/2)}{\cosh x} \frac{e^{-x}}{x} dx = -\frac{1}{2} \int_0^1 \frac{(1-t)^2}{1+t^2} \frac{dt}{\ln t}.$$

This integral has value  $\ln \pi/4$  and it appears as entry **4.267.2**.