PROOF OF FORMULA 3.521.2

$$\int_0^\infty \frac{x\,dx}{\cosh x} = 2G$$

Let $u = e^{-x}$ to obtain
$$\int_0^\infty \frac{x\,dx}{\cosh x} = -2\int_0^1 \frac{\ln u\,du}{1+u^2}.$$
This last integral is evaluated as G, the Catalan constant, in formula 4.231.12.