

PROOF OF FORMULA 3.523.7

$$\int_0^{\infty} \frac{x^4 dx}{\cosh x} = \frac{5\pi^5}{32}$$

Entry 3.523.4 states that

$$\int_0^{\infty} \frac{x^{2n} dx}{\cosh x} = \left(\frac{\pi}{2}\right)^{2n+1} |E_{2n}|.$$

Take $n = 2$ and use $E_4 = 5$.