

PROOF OF FORMULA 3.527.5

$$\int_0^\infty \frac{x^{2m} dx}{\cosh^2 ax} = \frac{(2^{2m} - 2)\pi^{2m}}{(2a)^{2m}a} |B_{2m}|$$

From entry **3.527.3** it follows that

$$\int_0^\infty \frac{x^{2m} dx}{\cosh^2 ax} = \frac{4}{(2a)^{2m+1}} (1 - 2^{1-2m}) \Gamma(2m + 1) \zeta(2m).$$

The result now follows from the identity

$$\zeta(2m) = \frac{2^{2m-1}}{(2m)!} \pi^{2m} |B_{2m}|.$$

It should be written as

$$\frac{4(2^{2m} - 1)\pi^{2m} |B_{2m}|}{(2a)^{2m+1}}$$