

**PROOF OF FORMULA 3.524.6**

$$\int_0^{\infty} x^{2m} \frac{\cosh ax}{\cosh bx} dx = \frac{\pi}{2b} \left( \frac{d}{da} \right)^{2m} \left( \sec \frac{\pi a}{2b} \right)$$

Entry 3.511.4 states that

$$\int_0^{\infty} \frac{\cosh ax}{\cosh bx} dx = \frac{\pi}{2b} \sec \left( \frac{\pi a}{2b} \right).$$

The result follows by differentiating  $2m$  times with respect to the parameter  $a$ .