

PROOF OF FORMULA 3.524.14

$$\int_0^{\infty} x^5 \frac{\sinh ax}{\cosh bx} dx = \sin \frac{\pi a}{2b} \left(\frac{\pi}{2b} \sec \frac{\pi a}{2b} \right)^6 \left(120 - 60 \cos^2 \frac{\pi a}{2b} + \cos^4 \frac{\pi a}{2b} \right)$$

Entry **3.524.4** states that

$$\int_0^{\infty} x^5 \frac{\sinh ax}{\cosh bx} dx = \frac{\pi}{2b} \left(\frac{d}{da} \right)^5 \sec \frac{\pi a}{2b}.$$

The result is obtained by computing the derivative.