

PROOF OF FORMULA 3.524.21

$$\int_0^\infty x^4 \frac{\cosh ax}{\cosh bx} dx = \left(\frac{\pi}{2b} \sec \frac{\pi a}{2b} \right)^5 \left(24 - 20 \cos^2 \frac{\pi a}{2b} + \cos^4 \frac{\pi a}{2b} \right)$$

Entry **3.524.6** states that

$$\int_0^\infty x^4 \frac{\cosh ax}{\cosh bx} dx = \frac{\pi}{2b} \left(\frac{d}{da} \right)^4 \sec \frac{\pi a}{2b}.$$

The result now follows by computing the derivative.