

**PROOF OF FORMULA 3.524.16**

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

Entry 3.524.8 states that

$$\int_0^{\infty} x \frac{\cosh ax}{\sinh bx} dx = \frac{\pi}{2b} \frac{d}{da} \tan \frac{\pi a}{2b}.$$

The result comes from computing the derivative.