PROOF OF FORMULA 3.527.13

$$\int_0^\infty x^2 \frac{\cosh ax}{\sinh^2 ax}\, dx = \frac{\pi^2}{2a^3}$$

In the proof of entry **3.527.9** the formula

$$\int_0^\infty x^{\mu-1} \frac{\cosh ax}{\sinh^2 ax}\, dx = \frac{2\Gamma(\mu)\zeta(\mu-1)}{a^\mu}(1 - 2^{1-\mu}).$$

has been established. The current integral is the special case $\mu = 3$.