PROOF OF FORMULA 3.522.6

$$\int_0^\infty \frac{dx}{(1+x^2)\cosh \pi x} = 2 - \frac{\pi}{2}$$

This is the special case $a = \pi$ and $b = 1$ of entry **3.522.3**. Therefore

$$\int_0^\infty \frac{dx}{(1+x^2)\cosh \pi x} = 2\sum_{k=1}^\infty \frac{(-1)^{k-1}}{2k+1}.$$

The result now follows from

$$\sum_{k=0}^\infty \frac{(-1)^k}{2k+1} = \frac{\pi}{4}.$$