PROOF OF FORMULA 3.642.2

$$\int_0^{\pi/2} \frac{\sin^{n-1} x \, \cos^{n-1} x}{(a^2 \sin^2 x + b^2 \cos^2 x)^n} \, dx = \frac{B(n/2, n/2)}{2(ab)^n}$$

Entry **3.642.1** states that

$$\int_0^{\pi/2} \frac{\sin^{2\mu-1} x \, \cos^{2\nu-1} x}{(a^2 \sin^2 x + b^2 \cos^2 x)^{\mu+\nu}} \, dx = \frac{B(\mu, \nu)}{2a^{2\mu} b^{2\nu}}.$$

The result comes from the special case $\mu = \nu = \frac{n}{2}$.