PROOF OF FORMULA 3.621.5

$$\int_0^{\pi/2} \sin^{\mu-1} x \, \cos^{\nu-1} x \, dx = \frac{1}{2} B\left(\frac{\mu}{2}, \frac{\nu}{2}\right)$$

In the integral representation

$$B(a,b) = \int_0^1 t^{a-1}(1-t)^{b-1} \, dt,$$

let $t = \sin^2 x$ to obtain

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

The result follows by letting $\mu = 2a$ and $\nu = 2b$.