

PROOF OF FORMULA 3.251.1

$$\int_0^1 x^{\mu-1}(1-x^\lambda)^{\nu-1} dx = \frac{1}{\lambda} B\left(\frac{\mu}{\lambda}, \nu\right)$$

Let $t = x^\lambda$ to obtain

$$\int_0^1 x^{\mu-1}(1-x^\lambda)^{\nu-1} dx = \frac{1}{\lambda} \int_0^1 t^{\mu/\lambda-1}(1-t)^{\nu-1} dt.$$

The result now follows from the integral representation of the beta function

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