

**PROOF OF FORMULA 4.293.13**

$$\int_0^1 \frac{x^{\mu-1} \ln(1-x)}{(1-x)^{1-\nu}} dx = B(\mu, \nu) [\psi(\nu) - \psi(\mu + \nu)]$$

Start with

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

and differentiate with respect to  $\nu$  to produce

$$\frac{d}{d\nu} B(\mu, \nu) = B(\mu, \nu) [\psi(\nu) - \psi(\mu + \nu)].$$

This is the result.