PROOF OF FORMULA 4.352.4

$$\int_0^\infty x^{\nu-1}e^{-x}\ln x\,dx = \Gamma'(\nu)$$

The integral representation of the gamma function is

$$\Gamma(\nu) = \int_0^\infty x^{\nu-1}e^{-x}\,dx.$$

Now differentiate with respect to the parameter ν.