PROOF OF FORMULA 3.462.9

$$\int_0^\infty x^{\alpha-1}e^{-px^\mu}\,dx = \frac{1}{\mu}p^{-\alpha/\mu}\Gamma\left(\frac{\alpha}{\mu}\right)$$

Let $t = px^\mu$ to obtain

$$\int_0^\infty x^{\alpha-1}e^{-px^\mu}\,dx = \frac{1}{\mu}p^{-\alpha/\mu}\int_0^\infty t^{\alpha/\mu-1}e^{-t}dt.$$

The integral is $\Gamma(\alpha/\mu)$.