

$$e^{\mu} = 1 + \mu + \frac{\mu^2}{2} + \frac{\mu^3}{3!} + \dots$$

$$e^{\lambda x} = 1 + \lambda x + \dots + \frac{(\lambda x)^k}{k!} + \dots$$

$$\int_0^{\infty} x^{\beta} e^{-\lambda x} dx$$

$$y = \lambda x$$

$$x = \frac{y}{\lambda}$$

$$dx = \frac{dy}{\lambda}$$

$$\lambda \int_0^{\infty} \left(\frac{y}{\lambda}\right)^{\beta} e^{-y} \frac{dy}{\lambda}$$

$$= \frac{1}{\lambda^{\beta}} \int_0^{\infty} y^{\beta} e^{-y} dy$$