

6.68(b)

$$\int_{\theta}^{\infty} y^n e^{-n(y-\theta)} dy.$$

$$\text{let } u = y - \theta \\ du = dy$$

$$I = n \int_0^{\infty} (u + \theta) e^{-nu} du$$

$$= \int_0^{\infty} (nu) e^{-nu} du + n\theta \int_0^{\infty} e^{-nu} du.$$

$$\text{let } v = nu$$

$$dv = n du$$

$$= \frac{1}{n} \int_0^{\infty} \underset{\uparrow}{v} e^{-v} dv + n\theta \left. -\frac{1}{n} e^{-nu} \right|_0^{\infty}.$$

kernel of gamma(2, 1)

$$= \frac{1}{n} \cdot \Gamma(2) \cdot 1^2 + n\theta \left( 0 - (-n^{-1} \cdot 1) \right)$$

$$= \frac{1}{n} + \theta.$$