Question #142
Key: C

$$0.575 = \Pr(N=0) = \int_0^k \Pr(N=0 \mid \theta)\pi(\theta)d\theta$$

$$= \int_0^k e^{-\theta}\frac{e^{-\theta}}{1-e^{-k}}d\theta = -\frac{e^{-2\theta}}{2(1-e^{-k})}\Bigg|_0^k = -\frac{e^{-2k}}{2(1-e^{-k})} + \frac{1}{2(1-e^{-k})}$$

$$= \frac{1-e^{-2k}}{2(1-e^{-k})} = \frac{1+e^{-k}}{2}$$

$$e^{-k} = 2(0.575) - 1 = 0.15$$

$$k = 1.90.$$