

## Question #250

Key: A

The density function is  $f(x) = \theta x^{-2} e^{-\theta/x}$  and the likelihood function is

$$L(\theta) = \theta(186^{-2})e^{-\theta/186}\theta(91^{-2})e^{-\theta/91}\theta(66^{-2})e^{-\theta/66}(e^{-\theta/60})^7$$

$$\propto \theta^3 e^{-0.148184\theta}$$

$$l(\theta) = \ln L(\theta) = 3\ln(\theta) - 0.148184\theta$$

$$l'(\theta) = 3\theta^{-1} - 0.148184 = 0$$

$$\theta = 3/0.148184 = 20.25.$$

The mode is  $\theta/2 = 20.25/2 = 10.125$ .