Stat 122 (Mathematical Statistics 2)

Problem Set No. 2

INSTRUCTIONS: Answer the following as indicated. Show detailed solutions.

1. Consider a random variable Y that has an exponential distribution with mean 4. Use the method of transformation to derive the density function for $U = 3Y + 1$.

2. A density function sometimes used by engineers to model lengths of life of electronic components is the Rayleigh density, given by

$$f_Y(y) = \begin{cases} \left(\frac{2y}{\theta}\right) e^{-y^2/\theta}, \, y > 0 \\ 0, \text{ elsewhere} \end{cases}$$

Find the probability density function for $U = Y^2$.