Problem 103

X_1: annual losses due to storm — $X_1 \sim \text{Exponential}(\theta = 1)$

X_2: annual losses due to fire — $X_2 \sim \text{Exponential}(\theta = 1.5)$

X_3: annual losses due to theft — $X_3 \sim \text{Exponential}(\theta = 2.4)$

X_1, X_2, X_3 independent

$$Y = \max(X_1, X_2, X_3)$$

$$P(Y>3) = 1 - P(Y<3)$$

$$= 1 - P(X_1<3) \cdot P(X_2<3) \cdot P(X_3<3) \qquad \text{due to independence}$$

$$F(x) = 1 - e^{-\frac{x}{\theta}}$$

$$= 1 - (1-e^{-3})(1-e^{-\frac{3}{1.5}})(1-e^{-\frac{3}{2.4}})$$

$$= .414$$

E