Problem 67

Strategy:

Payment structure table

X: number of consecutive days of rain beginning on April 1st

$X \sim \text{Poisson}(\lambda = .6)$

Y: amount insurance company will have to pay

X	0	1	2	3	4	...
Y	0	1000	2000	2000	2000	...
Y^2	0	1000^2	2000^2	2000^2	2000^2	...

$$Pr(X=K) = \frac{e^{-\lambda} \cdot \lambda^K}{K!}$$

$$Pr(X=0) = e^{-.6} = .548812$$

$$Pr(X=1) = (.6)e^{-.6} = .329287$$

$$Pr(X \geq 2) = 1 - Pr(X=0) - Pr(X=1) = .121901$$

$$\sigma_Y = \sqrt{E[Y^2] - E[Y]^2}$$

$$E[Y] = Pr(X=0)\cdot 0 + Pr(X=1)\cdot 1000 + Pr(X \geq 2)\cdot 2000$$

$$= .548812(0) + .329287(1000) + .121901(2000) = \underline{573.089}$$

$$E[Y^2] = Pr(X=0)\cdot 0 + Pr(X=1)\cdot 1000^2 + Pr(X \geq 2)\cdot 2000^2$$

$$= .548812(0) + .329287(1000^2) + .121901(2000^2) = \underline{816,891}$$

$$\sigma_Y = \sqrt{816,891 - (573.089)^2}$$

$$= \underline{\underline{699}}$$

B