

Answer on Question #72708 – Math – Statistics and Probability

Question

Find the mean and variance of the random variable X in Exercise 5.58, representing the number of hurricanes per year to hit a certain area of the eastern United States.

5.58 A certain area of the eastern United States is, on average, hit by 6 hurricanes a year...

Solution

The random variable X represents the number of hurricanes per year to hit a certain area of the eastern United States. X is a Poisson random variable with $\lambda = 6$. Then

$$\Pr(X = k) = \frac{6^k}{k!} e^{-6}, k \in \{0, 1, 2, \dots\}.$$

The positive real number λ is equal to the expected value of X and also to its variance.

For the Poisson random variable X the mean and variance are equal to the number λ

$$E[X] = \text{Var}[X] = \lambda = 6.$$

Answer:

$$E[X] = \text{Var}[X] = \lambda = 6.$$