

Answer on Question #71063 – Math – Statistics and Probability

Question

The average number of traffic accidents on a certain section of highway is two per week. Assume that the number of accidents follow a Poisson distribution with $\mu = 2$. Find the probability of at least 2 accidents on this section of highway during a week period.

Solution

Let X be a random variable denoting the number of accidents on a particular section of highway during a week.

We know, $X \sim \text{Poisson}(2)$

$$P(X=a) = \frac{e^{-2} 2^a}{a!} \dots\dots\dots \text{Equation (1)}$$

We need to find

$$\begin{aligned} P(X \geq 2) &= 1 - P(X=0) - P(X=1) \\ &= 1 - e^{-2} - 2e^{-2} \dots\dots\dots [\text{Putting } a=0 \text{ and } a=1 \text{ in Equation (1)}] \\ &= 1 - 3e^{-2} \end{aligned}$$

Answer: $1 - 3e^{-2}$.