Answer on Question #46546 – Math – Statistics and Probability

The number of flaws in a fiber optics cable follows a Poisson process with an average of 0.75 per 100 feet. Find the probability of at least three flaws in 200 feet cable.

Solution

We have a 200 feet cable, then $\lambda = \frac{0.75}{100} \cdot 200 = 1.5$.

The probability of at least three flaws in 200 feet cableis

$$P(\text{at least three}) = 1 - (P(0) + P(1) + P(2)).$$

Using Poisson distribution:

$$P(\text{at least three}) = 1 - \left(\frac{1.5^0 e^{-1.5}}{0!} + \frac{1.5^1 e^{-1.5}}{1!} + \frac{1.5^2 e^{-1.5}}{2!}\right) = 1 - e^{-1.5}(1 + 1.5 + 1.125) = 0.19.$$

Answer: $\mathbf{0.19}$.