

## Answer on Question #58142 – Math – Statistics and Probability

### Question

Consider a Poisson distribution with a mean of two occurrences per time period.

- a. Write the appropriate Poisson probability function.
- b. What is the expected number of occurrences in three time periods?
- c. Write the appropriate Poisson probability function to determine the probability of  $x$  occurrences in three time periods.
- d. Compute the probability of two occurrences in one time period.
- e. Compute the probability of six occurrences in three time periods.
- f. Compute the probability of five occurrences in two time periods.

### Solution

a. 
$$P(x; \mu) = \frac{e^{-\mu} \mu^x}{x!} = \frac{e^{-2} 2^x}{x!}$$

b. 
$$N = \mu \times 3 = 6$$

c. 
$$P(x; 6) = \frac{e^{-6} 6^x}{x!}$$

d. 
$$P(2; 2) = \frac{e^{-2} 2^2}{2!} = 0.2707$$

e. 
$$P(6; 6) = \frac{e^{-6} 6^6}{6!} = 0.1606$$

f. 
$$P(5; 4) = \frac{e^{-4} 4^5}{5!} = 0.1563$$