Problem

Suppose you work at a customer service center, and on average, you receive 5 customer complaints per hour. First, determine the probability (%) that you receive exactly 3 complaints in the next hour (i.e., P(X=3)) and calculate the expression: $\frac{5.7*P(X=3)}{20}$, plus round your answer to the nearest integer.

Solution

Given that the average rate (λ) of customer complaints per hour is 5, and we want to find the probability of receiving exactly 3 complaints (k = 3), we can use the Poisson distribution formula:

$$P(X = k) = \frac{\lambda^k * e^{-\lambda}}{k!}$$

Substituting the given values:

$$P(X = 3) = \frac{5^3 * e^{-5}}{3!} = 0.1404 = 14.04\%$$

$$\frac{5.7 * P(X = 3)}{20} = \frac{5.7 * 14.04\%}{20} \cong \mathbf{4}\%$$

Answer: 4

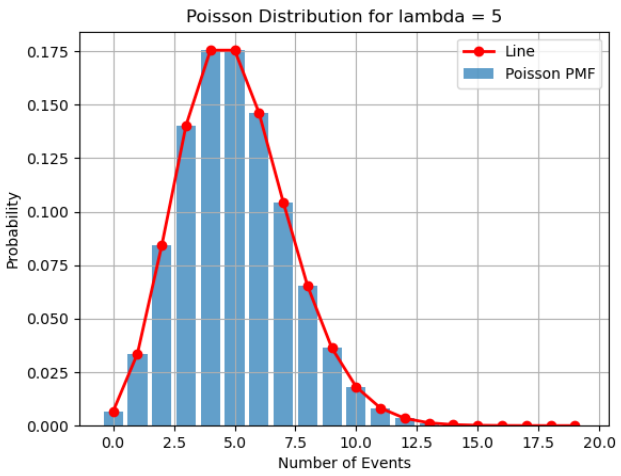

Figure 1. Poisson distribution (λ =5)