

Question

The customers of a certain newspaper seller arrive according to a Poisson process at a rate of 1 customer per minute. What is the probability that at least 5 minutes have elapsed since (i) the last customer arrived, (ii) the next to last customer arrived?

Answer

$N =$ number of customers in 5 minutes $\sim P(5)$

(i) $P(N = 0) = e^{-5} = 0.0067\dots$

(ii) $P(N = 0) + P(N = 1) = e^{-5} + 5e^{-5} = 0.0404\dots$

(at least five minutes have elapsed since the next to last customer arrived, if the last five minutes included either 0 or 1 customers)