

Worksheet 4 - Inhomogeneous Poisson process

Exercise 1. Customer's arrival time at a post office.

We count the number of customers who arrive at a post office that opens at 8:00 a.m. and closes at 5:00 p.m.

- From 8:00 a.m. to 11:00 a.m., customers seem to arrive, on average, at a steadily increasing rate that starts with an initial rate of 5 customers per hour at 8:00 a.m., and reaches a maximum of 20 customers per hour at 11:00 a.m.
- From 11:00 a.m. to 1:00 p.m., the (average) rate seems to remain constant at 20 customers per hour.
- Then, the (average) arrival rate drops steadily from 1:00 p.m. until closing time at which time, it has the value of 12 customers per hour.

1. What is a good probability model? Write the intensity.
2. What is the probability that no customer arrive between 8:30 a.m. and 9:30 a.m.?
3. What is the expected number of arrivals between 8:30 a.m. and 9:30 a.m.?