1. Customers arrive at a coffee shop according to a Poisson distribution at an average number of 5 customers per hour. During a fixed one hour time period,
   (a) What is the probability that no customers arrive?
   (b) What is the probability that 5 customers arrive?
   (c) What is the probability that less than 5 customers arrive?
   (d) Suppose it takes about 4 minutes to service one customer. What is the expected total service time and variance of the total service time?

2. Suppose we are throwing darts at interestingly shaped dart boards. The darts land uniformly within the board. Suppose the dart board is a square with side length 4 inches.
   (a) What is the probability of landing in the top half of the board?
   (b) What is the probability of landing within one inch of the edge?
   Suppose the dart board is a circle of radius 4.
   (c) What is the probability of landing within 1 inch of the center?
   (d) What is the probability of landing within 1 inch of the edge?
   (d) What is the median value in terms of the radius? Namely, for which radius \( r \) do we find that the probability of landing within \( r \) inches of the center is \( \frac{1}{2} \)?

3. Exam scores are observed to have a Normal distribution with mean 85 and standard deviation 5.
   (a) What is the probability that a random student scored between 83 and 87?
   (b) What is the probability that a random student scored below a 30?
   (c) What is the probability that a random student scored above a 95?