1. The waiting time until the phone rings is exponential, with an average waiting time of 30 minutes.

a. What is the probability that nobody calls during the next hour?

b. What is the standard deviation (in minutes) of time until the next call?

2. A chef working in a kitchen believes that the waiting time until the next dessert order is exponential, with an average of 3 minutes. The waiting time until the next appetizer order is also exponential, with an average of 2 minutes. These waiting times are independent.

Find the probability that the next dessert is ordered before the next appetizer.

3. Suppose that the times until Hector, Ivan, and Jacob's pizza arrives are independent exponential random variables, each with average of 20 minutes. Find the probability that none of the waiting times exceed 20 minutes. I.e., find $P(\max(X, Y, Z) \leq 20)$.

4. Suppose that, when an airplane waits on the runway, the company must pay each customer a fee if the waiting time exceeds 3 hours. Suppose that an airplane with 72 passengers waits an exponential amount of time on the runway, with average 1.5 hours. If the waiting time X, in hours, is bigger than 3, then the company pays each customer $(100)(X - 3)$ dollars (otherwise, the company pays nothing). What is the amount that the company expects to pay for the 72 customers on the airplane altogether? (Of course their waiting times are all the same.)

5. Let X be uniform on $[0, 10]$. Let Y be exponential with $\mathbb{E}(Y) = 5$. Find $P(X < Y)$.