KNEWTON | alta

Exponential Distribution

Learning Objectives

- Compute the probability using the exponential distribution
- Compute the mean, median and standard deviation of the exponential distribution

Compute the probability using the exponential distribution

1. The length of time waiting in line at a certain grocery store on Saturday is exponentially distributed with a mean of half-an-hour (time in hours). Calculate the probability that a customer will wait for 45 minutes or longer. Round your answer to tenths of a percent.

Compute the mean, median and standard deviation of the exponential distribution

2. Consider the wait time in problem (1). Calculate the following:
    a. What is the median wait time? Round your answer to two decimal places.

b. What is the standard deviation of wait time? Round your answer to the nearest tenth of a hour.

- $f(x) = \begin{cases} \lambda e^{-\lambda x}, x \geq 0 \\ 0, \quad x < 0 \end{cases}$
- $\mu = \int_a^b x f(x) dx$
- $\sigma^2 = \int_a^b (x - \mu)^2 f(x) dx$

ANSWER KEY

1. 68.73%
2. a. 1.39 hours ≈ 83 minutes; b. 2 hours