1 Continuous Random Variables

Definition

Examples

Probability Density Function

Example

$$f(x) = \begin{cases} 12x^2(1-x) & \text{if } 0 \le x \le 1\\ 0 & \text{otherwise} \end{cases}$$

Plot the graph of f(x). Is f(x) a probability density function? Why or why not?

If f(x) is a pdf then calculate the following.

a. P(X = 0.4)

b. P(X < 0.4)

c. $P(0.6 \le X \le 0.8)$

Calculate E[X]

Calculate Var[X]

2 Review

Q1. data.frame (x = c(0, 0.5, 1), y = c(0, 2, 0)) %>% ggplot(aes(x = x, y = y)) + geom_line() + labs(y = "f(x)")



Is the function depicted with the plot above a pdf? Why/not?

Q2. a. A lottery game requires players to guess six numbers from 1 to 49. If a player guessed all the six numbers then they win the lottery of the week. What is the probability that a player will win the lottery?

b. What is the expected number of weeks until the first win for a player?

c. What is the variance?

- Q3. A customer service agent receives on average 2 calls every 5 minutes.
 - a. What is the probability that they will receive 0 calls in the next 5 minutes?

b. What is the probability that they will receive more than 2 calls in the next 5 minutes?