

Continuous Random Variables Applications

Name

08 June, 2020

Exercises

1. Let X be a continuous random variable on the domain $-k \leq X \leq k$. Also, let $f(x) = \frac{x^2}{18}$.
 - a) Assume that $f(x)$ is a valid pdf. Find the value of k .
 - b) Plot the pdf of X .
 - c) Find and plot the cdf of X .
 - d) Find $P(X < 1)$.
 - e) Find $P(1.5 < X \leq 2.5)$.
 - f) Find the 80th percentile of X (the value x for which 80% of the distribution is to the left of that value).
 - g) Find the value x such that $P(-x \leq X \leq x) = 0.4$.
 - h) Find the mean and variance of X .
2. Let X be a continuous random variable. Prove that the cdf of X , $F_X(x)$ is a non-decreasing function. (Hint: show that for any $a < b$, $F_X(a) \leq F_X(b)$.)