

Quantitative Methods and Simulation

Given the following functions, calculate 'k' such that f(x) is a probability density function (P.D.F) and calculate the given probabilities.

a) $f(x) = kx^2 + \frac{1}{30}, x \in [0,3]$

- $P(X < 1) =$
- $P(0.2 \leq X \leq 2.6) =$

b) $f(x) = \begin{cases} k + x, & -1 < x < 0 \\ k - x, & 0 \leq x < 1 \end{cases}$

- $P(0.2 < X < 0.6) =$
- $P(-0.5 < X < 0.2) =$

c) $f(x) = \frac{3}{1000}x^2, x \in [0, k]$

- $P(X > 8.5) =$
- $P(X = 2) =$

d) $f(x) = 2ke^{-kx}, 0 \leq x \leq 4$

- $P(1 \leq X \leq 2) =$