

Show all your work. Late homework will not be accepted without prior approval by email.

1. Let $f_X(x) = x^2/10$, $x = -2, -1, 1, 2$.
 - (a) Show f_X is a probability density function.
 - (b) Find $P(X > 0)$.
 - (c) Find $P(X \leq 1)$.
 - (d) Find the density function for $Y = X^2$.

2. Let $f_X(x) = 1/x^2$, $x > 1$.
 - (a) Show f_X is a probability density function.
 - (b) Find $P(X < 4)$.
 - (c) Sketch the graph of f_X and shade the area represented by the probability in (b).
 - (d) Find F_X and sketch its graph.
 - (e) Find the density function for $Y = X^2$.
 - (f) Find the density function for $Z = 1/X$.
 - (g) Show $P(X < 4) = P(Z > 1/4)$.