Name: _____   Group _____

1) Let X have density
$$f_X(x) = \frac{1}{5}, \qquad for\ 2 \leq x \leq 7,$$
and $f_X(x) = 0$ otherwise.

a) Find the expected value of X, i.e. $\mathbb{E}(X)$.

b) Find the expected value of X^2, i.e. $\mathbb{E}(X^2)$.

c) Find the expected value of $1/X^2$, i.e., $\mathbb{E}(1/X^2)$.

d) Find the variance Var(X).

e) Find the standard deviation, σ_X.

d) Find $\mathbb{E}(X^2 - 2X + 4)$.

2) The distance X, in yards, a that small person can throw a 50-pound weight, has density
$$f_X(x) = -0.0375 \, x^2 + 0.075 \, x + 0.3 \quad \text{for } 0 \le x \le 4,$$
and $f_X(x) = 0$ otherwise.

a) Find the expected value of X.

b) Find the variance of X.

c) Find Var(X).

Find $\mathbb{E}(X^2 - 3)$.

c) Find Var($2X^2 - 3$).

3) Using the following joint density function

$$f_{X,Y}(x,y) = \begin{cases} 3(x^3 + y^2 - xy) & 0 \le x \le 1, 0 \le y \le 1 \\ 0 & else \end{cases}$$

a) What is the expected value of X?

b) What is the expected value of X^2?

c) What is the expected value of Y?

d) What is the expected value of X + Y?

e) What is the expected value of $X^2 + Y$?

f) What is the expected value of XY?