Name: _____
Date: _____

Discrete Probability Distributions Worksheet

1. You flip four coins. Let X, the random variable, be the number of heads on all four coins.

a. List the sample space for the experiment. (all possible outcomes)

b. What are the possible values for x? (how many heads can land)

c. Is the random variable, x, continuous or discrete?

d. Construct a probability distribution for this experiment.

X	
P(X)	

e. Construct a histogram for the probability distribution in the space below.

2. Determine if the following are probability distributions (if no, state why).

a.

X	3	6	9	12	15
P(X)	4/9	2/9	1/9	1/9	1/9

b.

X	1	2	3	4	5
P(X)	3/10	1/10	1/10	2/10	3/10

c.

X	20	30	40	50
P(X)	1.1	0.2	0.9	0.3

Name: _____

3. Construct a probability distribution for the data and draw a histogram for the following:

a. The probabilities that a patient will have 0, 1 2, or 3 medical tests performed on entering a hospital are 6/15, 5/15, 3/15, and 1/15 respectively.

X

P(X)

b. A die is loaded in such a way that the probabilities of getting 1, 2, 3, 4, 5, and 6 are 1/2, 1/6, 1/12, 1/12, 1/12, and 1/12 respectively.

X

P(X)

c. A box contains 3 $1 bills, 2 $5 bills, 1 $10 bill, and 1 $20 bill.

X

P(X)

d. A family has three children. Let X represent the number of boys. * order doesn't matter*

X

P(X)

Name: _____

4. Below is a probability distribution for the number of math failures of BC students. (X = students who have failed)

X	0	1	2	3	4
P(X)	.41	.38		.08	.02

a. P(X = 2)

b. P(X < 2)

c. P(X ≤ 2)

d. P(X ≤ 1)

e. P(X > 2)

f. P(X = 3 or X = 4)

Name: _____

Games & Expectation

1. A box contains ten $1 bills, five $2 bills, three $5 bills, one $10 bill, and one $100 bill. A person is charged $20 to select one bill. Find the expected value for this game. Is this game fair?

2. If a person rolls doubles when he tosses two dice, he wins $5. The cost to play the game is $1. Is this game fair?

3. A raffle sells 100 tickets at $5 a piece. There is one $500 prize, five $100 prizes, and ten $50 prizes. What is the expected value? Hint: Find the P(You win) and V(You win) along with the P(You lose) and V(You lose).