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.

b. What are the possible values for x?

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

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3. Determine if the following are discrete or continuous random variables:

a. The speed of a race car in mph.

b. The number of cups of coffee that Mrs. Lowery drinks each day.

c. The number of people that play the SC Lottery each day.

d. The weight of a rhinoceros.

e. The time it takes to complete Mrs. Lowery's midterm.

f. The number of math majors at USC.

g. The blood pressures of patients at Lexington Medical Center.

4. 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)

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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.

X
P(X)

5. Below is a probability distribution for the number of math failures of BC students.

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

a. $P(X = 2)$

b. $P(X < 2)$

c. $P(X \leq 2)$

d. $P(X \leq 1)$

e. $P(X > 2)$

f. $P(X = 3 \text{ or } X = 4)$

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Mean, Variance, and Expectation

1. From past experience, a company has found that in carton of transistors, 92% contain no defective transistors, 3% contain one defective transistor, 3% contain two defective transistors, and 2% contain three defective transistors.

    a. Construct a probability distribution below.

    X
    P(X)

    b. Calculate the mean, variance, and standard deviation for the defective transistors.

    $\mu =$

    $\sigma^2 =$

    $\sigma =$

2. The number of suits sold per day at Suit World is shown in the probability distribution below.

X	19	20	21	22	23
P(X)	0.2	0.2	0.3	0.2	0.1

    a. Find the mean, variance, and standard deviation of the distribution.

    $\mu =$

    $\sigma^2 =$

    $\sigma =$

    b. If the manager of Suit World wants to make sure that he has enough suits for the next five days, how many should he buy to stock the store?

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3. The Bank of America VP feels that each savings account customer has, on average, three credit cards. The following distribution represents the number of credit cards people own.

X	0	1	2	3	4
P(X)	0.18	0.44	0.27	0.08	0.03

a. Find the mean, variance, and standard deviation.

$\mu =$

$\sigma^2 =$

$\sigma =$

b. Is the VP correct?

4. Rish Florist determines the probabilities for the number of flower arrangements they deliver each day.

X	6	7	8	9	10
P(X)	0.2	0.2	0.3	0.2	0.1

a. Find the mean, variance, and standard deviation.

$\mu =$

$\sigma^2 =$

$\sigma =$

b. Approximately how many arrangements should Rish expect to deliver each week?

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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.