-			
13	I can use a probability distribution to answer questions about possible values of a random variable.		
14	I can calculate and interpret the mean of a random variable.	Today	
15	I can calculate and interpret the standard deviation of a random variable.	Today	
16	I can describe the effects of transforming a random variable.		
17	I can calculate and interpret the mean and standard deviation of the sum or difference of two random variables.		
18	I can identify whether two random variables are independent.		
19	I can find probabilities involving the sum or difference of independent Normal random variables.		
20	I can describe the effects of transforming a random variable.		
21	I can determine whether the conditions for a binomial random variable have been met.		
22	I can compute and interpret probabilities involving binomial distributions.		
23	I can compute and interpret the mean and standard deviation of a binomial random variable.		
24	I can find probabilities involving geometric random variables.		
25	I can use the Normal approximation to the binomial distribution to calculate probabilities.		

Warm Up!

1. A continuous probability density curve is defined by the line y = 2x on the x interval [0, 1]. a) Verify that this is a density curve.

b) Find P(X > 0.1)

c) Find P(X = 0.2)

d) Find $P(0.2 \le X \le 0.7)$

Means and Standard Deviations of Discrete Random Variables

2. An insurance company has estimated the maintenance costs for the next year on a particular model of car:

Cost	\$ 0	\$500	\$1000	\$2000
Probability	.60	.05	.13	??

How much is the maintenance for the car expected to be for the next year?

 $\sigma^2 = \frac{\sum (x_i - \mu_x)^2}{n}$

Predict how can we find the variance of the above probability distribution?

In general, to calculate the *variance of a discrete random variable x*: $\sigma^2 =$

Now you try... 3.Shaquille O'Neal is a 45% free throw shooter. He gets fouled and gets to shoot two free throws. Let *x* be the possible number of points he can score on his two free throws. Find the probability distribution

•



What is Shaq's standard deviation?

4. The distribution of scores on a quiz (X) is shown below. State the mean and standard deviation of the quiz scores.

x	1	2	3	4	5	6	7	
p(x)	.01	.06	.11	.15	.19	.25	.23	

What is the probability that a randomly selected student scores within one standard deviation of the mean?

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

a. Identify the random variable of interest. Then construct a probability distribution for the data, and draw a probability distribution histogram.

b. Find P(X > 3.5).

c. Find $P(2 \le X \le 4.2)$.

6. A certain continuous probability density curve is made up of two straight line segments. The first segment begins at the point (0, 0.2) and goes to the point (2, 0.4). The second segment goes from (2, 0.4) to the point (3, 0.4).

a. Sketch this function, and verify that it is a legitimate density curve.

b. Find $P(2 < X \le 3)$.

c. Find P(X < 2).

d. Find P(1 < X < 3).

⁷ Sophie works at the Soccer Shop, and needs to order men's cleats, which come in sizes 6, 7, 8, 9, 10, 11, & 12. She would like to determine how many of each size to order. At first she thought to order the same number of each, but then she looked at sales receipts from the past 3 months. The following is what she found:

 Shoe iving
 6
 7
 8

Shoe size	6	7	8	9	10	11	12
# sold	85	122	138	154	177	133	92

a. Find the probability distribution for the # of cleats sold for each size.

b. What's the probability that a customer will select a shoe of at least size 11?

c. Compute the expected shoe size and the standard deviation of the shoe size.

d. If Sophie plans to order 1000 shoes, how many of size 8 should she order?