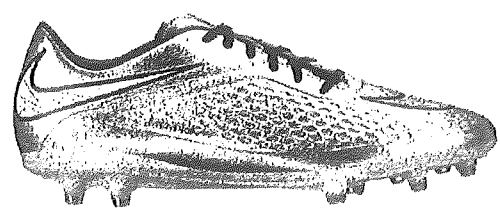


Name: Homework #6 Hour: \_\_\_\_\_ Date: \_\_\_\_\_

### Lesson 6.3: Day 2: Will the EKHS girls' soccer team win?



When the time runs out in a soccer game and the score is tied, the game will go to a shootout. Each team gets to choose 5 players to kick penalty kicks. Whichever team makes the most penalty kicks wins. If the EKHS girls' soccer team makes 60% of their penalty kicks, what are the chances they will win the game?

1. Is this a binomial setting? Explain.
2. Fill in the table below showing the probability of making X penalty kicks.

Goals (X)	0	1	2	3	4	5
Probability	.01024	.0768	.2304	.3456	.2592	.07776

3. Find and interpret the mean of the probability distribution. Show your work.

$\mu = n \cdot p$

$\mu = 3$  After many shootouts, we expect the average number of goals made to be 3 out of the 5 attempted.

4. Find and interpret the standard deviation of the distribution.

$\sigma = \sqrt{n \cdot p \cdot (1-p)}$

$\sigma = 1.09$  We expect the number of goals made in a shootout typically varies by 1.09 goals from the mean of 3 out of 5 goals.

5. What is the probability that the team scores at least one goal?

$$P(\text{At least 1}) = 1 - P(\text{None})$$

$$= 1 - .01024 = .98976$$

6. If the other team is expected to make 3 goals, what is the probability that the EKHS girls' team wins?

$$P(4 \text{ or } 5) = P(4) + P(5)$$

$$= .2592 + .07776$$

$$= .33696$$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## Lesson 6.3 Day 2 – Describing Binomial Distributions

Important ideas:

LT #1: Describing Binomial Distributions

• Shape: make histogram

• Center:  $\mu = n \cdot p$

• Variability:  $\sigma = \sqrt{n \cdot p \cdot (1-p)}$

Interpretations:  
make sure to  
say out of  
how many  
trials.

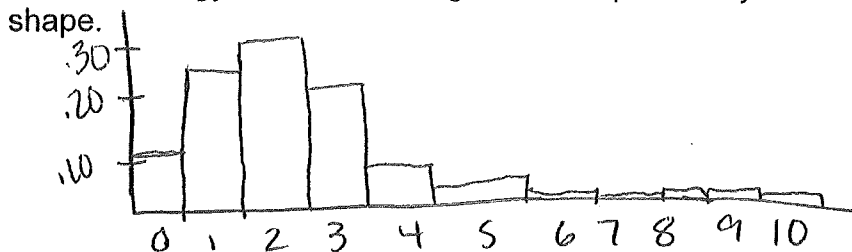
### Check Your Understanding

Mr. Miller's class is very difficult. It's so hard that when he gave a pop quiz recently, the students just guessed on every question! Each student in the class guesses an answer from A through E on each of the 10 multiple-choice questions. Hannah is one of the students in this class. Let  $Y$  = the number of questions that Hannah answers correctly.

1. Does this setting represent a binomial distribution? Explain.

Yes, it is binomial.  
B: Binary ✓  
Success → correct  
Failure → incorrect  
N: set number of trials ✓  $n=10$   
I: Independent ✓  
S: same probability ✓  $p=0.2$

2. Use technology to make a histogram of the probability distribution of  $Y$ . Describe its shape.



Skewed  
right with  
a single  
peak at 2

3. Calculate and interpret the mean of  $Y$ .

$$\mu = n \cdot p = 10 \cdot 0.2 = 2$$

After many quizzes, we expect the average number correct out of 10 is 2 questions.

4. Calculate and interpret the standard deviation of  $Y$ .

$$\sigma = \sqrt{n \cdot p \cdot (1-p)} = \sqrt{10 \cdot 0.2 \cdot (0.80)} = 1.26$$

The number correct on a quiz of 10 questions typically varies by 1.26 from the mean of 2.