

Name:

**5-A Introduction to Probability Distributions**

1. For each variable, state whether it would be treated as discrete or continuous.

- a) pencil length
- b) number of bedrooms
- c) number of pages in a book
- d) 400 meter race time

2. List the following probability distributions. Estimate when needed.

- a) roll on a 6-sided die
- b) hair color at SVHS

3. Finish the following chart to find the mean and standard deviation of the sum of two 4-sided dice.

$x$	$P(x)$	$xP(x)$	$x - \mu$	$(x - \mu)^2$	$P(x)(x - \mu)^2$
2	$1/16$	$2/16$	-3	9	$9/16$
3	$2/16$	_____	_____	_____	_____
4	$3/16$	_____	_____	_____	_____
5	$4/16$	_____	_____	_____	_____
6	$3/16$	_____	_____	_____	_____
7	$2/16$	_____	_____	_____	_____
8	$1/16$	_____	_____	_____	_____
		$\mu =$ _____			$\sigma^2 =$ _____
					$\sigma =$ _____

**5-B Geometric and Binomial Probabilities**

4. Ben is predicting rolls on a 6-sided die. Calculate the probability that his first correct prediction will be...

- a) after his 4<sup>th</sup> roll
- b) on his 5<sup>th</sup> roll

5. Logan correctly predicts 2 out of 3 rolls on a 4-sided die. Identify or calculate the following values.

- a)  $n$
- b)  $r$
- c)  $p$
- d)  $q$
- e)  $(?)$
- f)  $p^r$
- g)  $q^{n-r}$
- h)  $(?)p^r q^{n-r}$

6. August correctly predicts 3 out of 3 rolls on a 4-sided die. Identify or calculate the following values.

a)  $n$

b)  $r$

c)  $p$

d)  $q$

e)  $\binom{n}{r}$

f)  $p^r$

g)  $q^{n-r}$

h)  $\binom{n}{r}p^r q^{n-r}$

7. Fill in the blanks to calculate the probability of correctly predicting at least 2 out of 3 rolls on a 4-sided die.

$$P(\text{____}) + P(\text{____}) = \text{_____} + \text{_____} = \text{_____}$$

8. Use the formula to calculate the probability of predicting exactly 2 rolls out of 8 on 6-sided dice.

9. Fill in the blanks to calculate the following probabilities with calculator functions.

a) The probability of predicting exactly 2 rolls out of 8 on 6-sided dice is `binom____df (____, ____, ____)` = \_\_\_\_\_.

b) The probability of predicting at most 2 rolls out of 8 on 6-sided dice is `binom____df (____, ____, ____)` = \_\_\_\_\_.

c) The probability of predicting at least 2 rolls out of 8 on 6-sided dice is \_\_\_\_ `binom____df (____, ____, ____)` = \_\_\_\_\_.

### 5-C Binomial Distributions

10. Madison will predict 4 rolls on an 8-sided die. Fill in the blanks.

a)  $n =$  \_\_\_\_\_

b)  $p =$  \_\_\_\_\_

c)  $\mu =$  \_\_\_\_\_

d)  $\sigma =$  \_\_\_\_\_

e)  $P(0) = \text{binompdf}(4, 1/8, 0) =$  \_\_\_\_\_% is the probability that Madison will correctly predict \_\_\_\_\_.

f)  $P(1) =$  \_\_\_\_\_

g)  $P(2) =$  \_\_\_\_\_

h)  $P(3) =$  \_\_\_\_\_

i)  $P(4) =$  \_\_\_\_\_

11. Use your answers to (e) through (i) above to make a histogram showing Madison's probability distribution.