Unit 4 Review

Name_____
Date_____Period____

The table shows the genders and first initials of the students in the math club.

	Name Starts with A–M	Name Starts with N–Z	TOTAL
Boy	16	8	24
Girl	14	12	26
TOTAL	30	20	50

1. Find P(Name Starts with N-Z)

$\frac{20}{50} = \frac{2}{5}$

2. Find P(Girl)

$\frac{26}{50} = \frac{13}{25}$

3. Find P(Boy ∩ Name Starts with A-M)

$\frac{16}{50} = \frac{8}{25}$

4. Find P(Girl ∪ Name Starts with N-Z)

$\frac{26}{50} + \frac{20}{50} - \frac{12}{50} = \frac{34}{50} = \frac{17}{25}$

5. Find P(Boy | Name Starts with N-Z)

$\frac{8}{20} = \frac{2}{5}$

6. Find P(Name Starts with A-M | Girl)

$\frac{14}{26} = \frac{7}{13}$

7. A mall surveyed 120 shoppers to find out if they typically wait for a sale or buy on impulse. One-fourth of those surveyed buy on impulse. 40 women wait for a sale and 20 men buy on impulse. Fill in the table completely.

	Wait for a Sale	Buy on Impulse	Total
Woman	40	10	50
Man	50	20	70
Total	90	30	120

Let M be the event that a person is man. Let S be the event that a person waits for sale.

a. Find $P(M)$

$\frac{70}{120} = \frac{7}{12} = 0.58\overline{3}$

b. Find $P(S)$

$\frac{90}{120} = \frac{3}{4} = 0.75$

c. Find $P(M \cap S)$

$\frac{50}{120} = \frac{5}{12} = 0.41\overline{6}$

d. Are the events independent? Why/Why not?

no $\frac{7}{12} \times \frac{3}{4} \neq \frac{5}{12}$ $0.58\overline{3} \times 0.75 \neq 0.41\overline{6}$

8. The table shows the number of Freshman and Sophomores in band and chorus.

	Band	Chorus	Total
Freshman	42	14	56
Sophomore	63	21	84
TOTAL	105	35	140

a. Find $P(\text{Sophomore})$

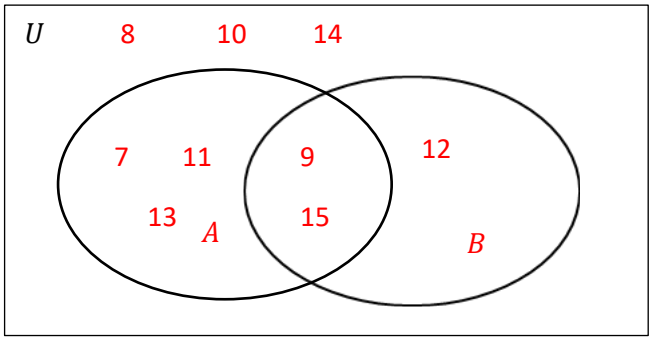
$\frac{84}{140} = \frac{3}{5} = 0.6$

b. Find $P(\text{Sophomore}|\text{Band})$ $\frac{63}{105} = \frac{3}{5} = 0.6$

b. Look at your answers to a and b. What does that mean?

They are equal. The events are independent.

9. Create a Venn diagram to represent sets A, B & U.
$A = \{7,9,11,13,15\}$
$B = \{9,12,15\}$
$U = \{7,8,9,10,11,12,13,14,15\}$



a. $P(B)$ b. $P(A \cap B)$ c. $P(A \cup B)$ d. $P(A^C)$

$\frac{3}{9} = \frac{1}{3}$ $\frac{2}{9}$ $\frac{6}{9} = \frac{2}{3}$ $\frac{4}{9}$

Your bag of M&M's contains 6 brown, 8 green, 7 orange, and 3 red. Find the probability of:

10. picking a red $\frac{3}{24} = \frac{1}{8}$

11. not picking a brown $\frac{18}{24} = \frac{3}{4}$

12. picking a orange (you hate orange and put it back) and then picking a green $\frac{7}{24} \times \frac{8}{24} = \frac{7}{72}$

13. picking a red, eating it, and then picking another red $\frac{3}{24} \times \frac{2}{23} = \frac{1}{92}$

14. Determine whether each situation requires a permutation or a combination.

A. A pizza place has 10 toppings, and 3 are chosen for the pizza.
○ Permutation ● Combination

B. Five students are lined up to take a picture.
● Permutation ○ Combination

C. A password chosen from a list of 26 letters is used to access an online account.
● Permutation ○ Combination

D. Two students are chosen as class representatives.
○ Permutation ● Combination

15. How many permutations are there in the word MISSISSIPPI?

$$\frac{11!}{2!\,4!\,4!} = 34650$$

16. How many possible outfits do you have if you own 5 pairs of pants, 8 shirts, and 3 pairs of shoes?

$5 \times 8 \times 3 = 120$ outfits

17. Find the number of possible 5-person committees that can be formed from a group of 25 people.

$${}_{25}C_5 = \frac{25!}{5!(25-5)!} = 53{,}130$$

18. Find the number of possible officers (president, vice-president, secretary, treasurer, and liaison) that can be chosen from a group of 25 people.

$${}_{25}P_5 = \frac{25!}{(25-5)!} = 6{,}375{,}600$$