Unit 6 – Review

Name: _____ Date: _____

1. A bag of 2 red marbles, 4 blue marbles, 3 yellow, and 3 green marbles. A student reaches into the bag and picks a marble. What is the probability that the marble is blue **or** green?

n = 12

P (blue **or** green)= $\frac{4}{12} + \frac{3}{12} = \frac{7}{12} \approx .583$

2. A teacher has 9 red crayons, 4 blue crayons, 7 purple crayons, and 5 black crayons in a basket, find the probability of her picking a blue crayon and then a black crayon **without replacing** the first one? P(blue and black) without replacement

n = 25

P(Blue) · P(BLK)

$\frac{4}{25} \cdot \frac{5}{24} = \frac{1}{30} \approx .033$

3. Which pair of events is **mutually exclusive**?

1

A. Ride a roller coaster or ride a Ferris Wheel

B. Choose a red marble or choose a blue marble

C. Picking an ace or a club from a deck of cards.

4. What is the probability, as a decimal, that a randomly chosen person is a woman, **given** that she bought something?

P (woman | bought)

$\frac{4}{11} \approx .364$

Customers by Gender			
	Men	**Women**	
Bought	7	4	11
Didn't Buy	5	9	14
	12	13	25

5. A movie company shows its movies to a group of viewers before it's released. The results of one showing are in the table below.

What is the probability of choosing a person who is 35-44 and didn't like the movie?

P(35-44 ∩ didn't like) $\frac{13}{50} \approx .260$

Approval by Age Group				
	18–34	**35–44**	**45–54**	
Liked	12	5	9	26
Didn't Like	3	13	8	24
	15	18	17	50

6. Mrs. Klein surveyed 240 men and 285 women about their vehicles. Of those surveyed, 155 men and 70 women said they own a red vehicle. If a person is chosen at random from those surveyed, what is the probability of choosing a man **or** a person that owns a red vehicle?
Hint: Draw a two-way frequency table

	R	Not R	
M	155	85	240
W	70	215	285
	225	300	525

$P(M) + P(R) - OL$
$= \frac{240}{525} + \frac{225}{525} - \frac{155}{525}$
$= \frac{155}{525} \approx .295$

7. Write D (Dependent) or I (Independent) for each. Use P(A), P(B), and P(A and B)

D A. P(A) = 0.31; P(B) = 0.16; P(A and B) = 0.071 $\neq .0496$ Dep

I B. P(A) = 0.09; P(B) = 0.3; P(A and B) = 0.027 $= .027$ IND

I C. P(A) = 0.28; P(B) = 0.75; P(A and B) = 0.21 $= .21$ IND

I D. P(A) = 0..15; P(B) = 0.6; P(A and B) = 0.09 $= .09$ IND

8. Find the probability:
   - The probability that a high school senior will go to college is 0.65. lonely
   - The probability that a high school senior will go to college **and** live on campus is 0.42.

.646

What is the probability that a high school senior will live on campus, **given** that the person will go to college?

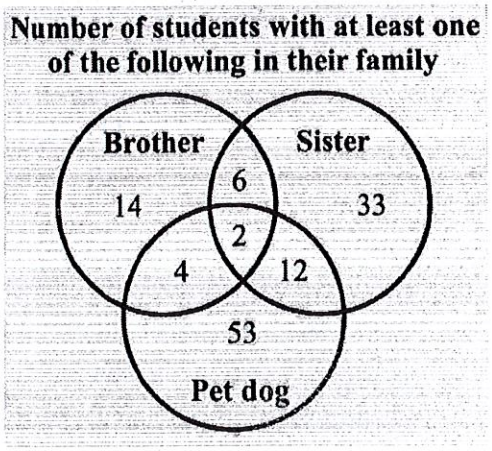
$P(A|B) = \frac{P(A \cap B)}{P(B)}$ $= \frac{.42}{.65} \approx .646$

71 10. In the Venn Diagram at right, how many members are in the set? {brother ∪ sister}

$14 + 4 + 2 + 6 + 12 + 33$ OR

71 11. In the Venn Diagram at right, how many members are in the set? {*Pet Dog*}

$53 + 4 + 2 + 12$



Unit 6 – Review

Show All Work!!!

A box of parts contains 10 good items and 4 defective items. $n = 14$

10/49 12. If 2 are selected at random **with replacement**, find the probability that one is defective **and** the other is not. *P(defective **and** not defective) with replacement*

≈.204

$\frac{4}{14} \times \frac{10}{14} = \frac{40}{196} = \frac{10}{49}$ with replacement = independent

4/91 13. If 2 are selected at random **without replacing** the first, find the probability that they are both defective. *P(defective and defective) without replacing*

.066

$\frac{4}{14} \times \frac{3}{13} = \frac{12}{182} = \frac{6}{91}$

A person rolls two dice, one after the other. Find the probability of the following events.

OL

$P(A) + P(B) - P(A \cap B)$

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

← 1st roll is a 3.

14. P(odd sum) **or** P(sum greater than 4)

$\frac{18}{36} + \frac{30}{36} - \frac{16}{36} = \frac{32}{36} = \frac{8}{9}$

15. P(even sum) **or** P(sum of 6)

$\frac{18}{36} + \frac{5}{36} - \frac{5}{36} = \frac{18}{36} = \frac{1}{2}$

16. What is the probability that the sum is less than 8, **given** the **first roll is a 3**? $\frac{4}{6} = \frac{2}{3}$

The governors of three states appoint a crime commission with the numbers shown in the chart below.

	Male	Female	
Florida	12	16	28
Alabama	14	18	32
Georgia	10	14	24
	36	48	84

.571 17. If the chairperson is randomly selected, find the probability that the person is a *female*. $\frac{48}{84} = \frac{12}{21} = \frac{4}{7}$

.571 18., What is the probability of that person being a f*emale* given that the chairperson is known to come from Florida? $\frac{16}{28} = \frac{4}{7}$ from FL

19. Find the probability of selecting a chairman who is female or from Georgia. watch for overlap!

$P(F) + P(G) - OL$

$\frac{48}{84} + \frac{24}{84} - \frac{14}{84} = \frac{58}{84} = \frac{29}{42} \approx .690$

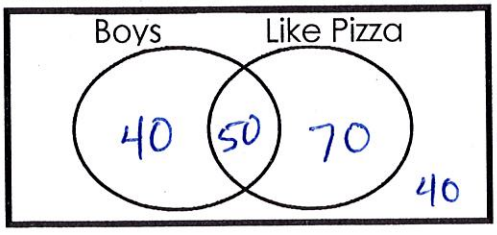
20. Are the events being a male and being from Florida independent of each other? **Show work.**

P(Male)= $\frac{36}{84} \approx .429$ P(Male | Georgia)= $\frac{24}{84} \approx .286$ $P(M \cap G) = \frac{10}{84} \approx .119$ (Ind.) (Dep.)

$.429 \times .286 \stackrel{?}{=} .119$

$.123 \neq .119$

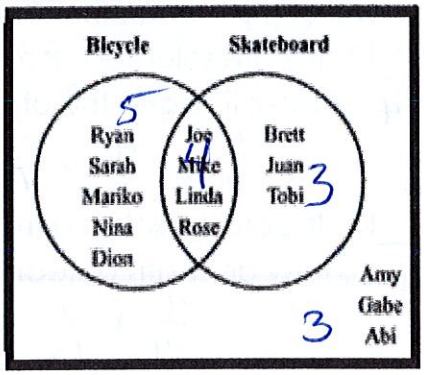
So DEP



A survey of 200 students was done in the school cafeteria. 90 were boys. 120 people surveyed liked pizza. 50 of the people that liked pizza were boys.

21. Fill in the Venn Diagram to represent this situation.

Use the Venn Diagram of the students that own bicycles and skateboards in Mr. Smith's class to find the following probabilities.



n = 15

22. Find P($\overline{Bicycle}$) not having a bike

23. Find P(Bicycle ∪ Skateboard)

24. What is the probability that a student has a *bicycle* **and** *skateboard*?

In an experiment to study color blindness, the following data was collected.

If a person is selected at random:

	Males	Females	Total
Color Blind	50	6	56
Not Color Blind	430	582	1012
Total	480	588	1068

25. Find $P(\overline{Male})$ (What does the line on top mean?) NOT!

26. Find P(Female ∩ Color Blind) AND

27. Find P (Female ∪ Color Blind) OR

28. Find P(Female | Color Blind) Given

29. On a given night in March, the probability that it is going to rain is 0.63, the chance that it is going to rain **and** snow is 0.17, and the chance that it is going to snow is 0.27. What is the probability that it is going to rain or snow?

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ ← use this

30. Suppose that the probability of Bill eating pizza on Friday night is 45%. The probability of Bill eating pizza **and** watching a movie on Friday night is 32%. Assuming that these events are dependent of each other, what is the probability Bill watches a movie on Friday **given** he ate pizza that night?

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$