Name: _____ Date: _____

Use the Counting Principle to answer the questions below.

Multiplication !!!

20 1. You have four shirts: plaid, striped, blue, and Hawaiian print. You have five pair of pants: red, black, green, jeans, and khaki. Use a tree diagram to determine how many ways you could make an outfit, consisting of pants and a shirt.

(4) (5) = 20 ways
shirt pants

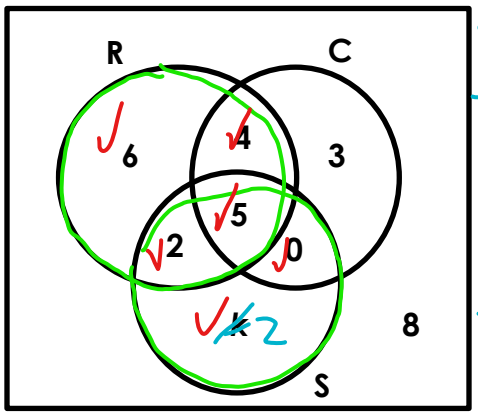
100,000 ways 2. You want to set a 6-digit passcode on your cell phone. How many different ways could you choose your passcode if the first number has to be your favorite number 8?

1 (10)(10)(10)(10)(10)(10) = 100,000 ways

120 ways 3. Four football players lining up to grab helmets before practice. If there are five helmets to choose, how many ways could the players choose helmets?

(5)(4)(3)(2) = 120 ways

The Venn Diagram below shows the results of a survey done by a teacher about the types of music listened to by 30 students. The survey was only related to rap (R), country (C), and soundtrack (S).



30 students
- 8
- 3
- 4
- 5
- 2
- 6
2

2 4. What is the value of *k*?

If a randomly selected student is asked their preference, what is the probability that the member listens to:

→ divide by total

3/30 = 1/10 5. Only country?

9/30 = 3/10 6. Rap ∩ country? → intersection (overlap) (and)

8/30 = 4/15 7. None of these genres?

22/30 = 11/15 8. At least one of these genres? 30 − 8 = 22

5/30 = 1/6 9. All of the genres?

0/30 = 0 10. Soundtrack and country, but not rap?

19/30 = 19/30 11. Rap ∪ soundtrack? → union (or) 6+4+5+2+6+2

P(A) + P(B) − P(A ∩ B)

Use the data below to find each of the following probabilities of choosing a vehicle.

Color	Type of Vehicle			Total
	Sedan	Van	Truck	
Red	8	0	11	19
Silver	10	14	10	34
Black	7	3	10	20
White	13	6	9	28
	38	23	40	101

12. P(Van) $\frac{23}{101} = .2277$

13. P(Van)' $\frac{78}{101} = .7722$

14. P(Black ∩ Truck) $\frac{10}{101} = .0990$

15. P(Red ∪ Sedan) $\frac{49}{101} = .4851$

$P(R) + P(S) - P(R \cap S) = 19 + 38 - 8 = 49$

On the gameshow "Let's Make a Deal" contestants can either choose to stay with their first choice of an unopened door to a prize or switch to the second choice of an unopened door to a prize. A survey of 50 events are shown in the table below.

	Switch	Stay	Total
Goat	8	12	20
Car	17	13	30
Total	25	25	50

Conditional Probability → Given... If... of... → Denominators

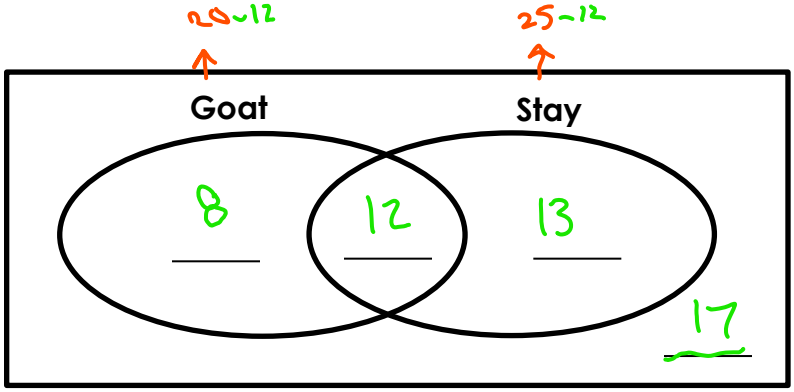
16. What is the probability that a person wins the car if they switched doors? $\frac{17}{25}$

17. What is the probability that a person wins the car if they "stay" with their first choice? $\frac{13}{25}$

18. Based upon your findings, are you more likely to win if you switch to the other unopened door? Switching makes you more likely to win a car because $17/25 > 13/25$

19. Are the events win a car and switch to the other unopened door mutually exclusive? (no overlap) Not mutually exclusive, because they overlap! 17 ppl who switch also win a car.

20. Complete the Venn Diagram that models the information taken from the table above.



50 − 8 − 12 − 13 = 17