5.5 Conditional Probability Assignment– Grandma's Birthday

Name:_____

Hr:_____

You've been invited to Grandma Adam's birthday party at the haunted mansion! All your crazy relatives and friends will be there. When you arrive, this is what you discover:

- 200 people are at the party
- 24 are relatives
- 43 are neither a friend or a relative
- 20 are both a friend and a relative

1. How many of your friends came to the party? Use the information above to complete the Venn diagram. *Note: a friend is anyone you've met. You are that kind of guy or gal.*

Party Room

Relative   Both   Friends

Neither
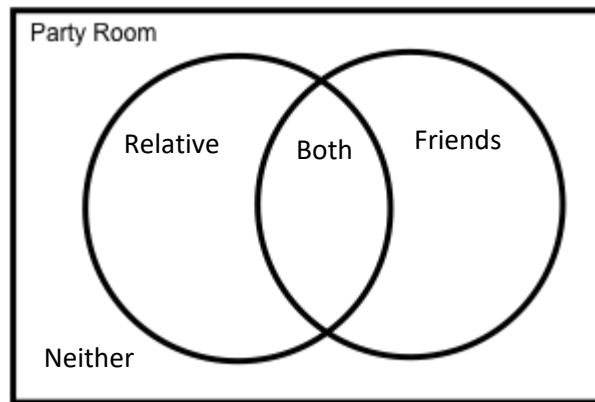
2. Once you've completed the Venn diagram, create a two-way table that displays the same data.

	Friend	Not Friend	Total
Relative			
Not Relative			
Total			

Use the information from your table on number 2 to answer the following questions. Use F to represent "Friend" and R to represent "Relative." Remember: $\cap$ means "**and**", $\cup$ means "**or**"

3. Find $P(F)$

4. Find $P(R)$

5. Find $P(\overline{R})$

6. Find $P(\overline{F})$

7. Find $P(R|F)$

8. Find $P(F|R)$

9. Find $P(F|\overline{R})$

10. Find $P(R|\overline{F})$

11. Find $P(\overline{R}|\overline{F})$

12. Find $P(F \cup R)$

13. Find $P(F \cap R)$

In a standard deck of playing cards (52 total cards) there are 4 suits (hearts, diamonds, clubs, spades) with 2 suits being red (hearts and diamonds) and the others being black (clubs and spades). In each suit there is one card of each number 2-10, 1 Jack, 1 Queen, 1 King, and 1 Ace (making 13 total in each suit). Face cards are Jack, Queen, and King. In each of the following situations you are drawing 1 card. Find the probability: Remember: $\cap$ means "**and**", $\cup$ means "**or**"

14. Find $P(\text{king} \cap \text{heart})$

15. Find $P(\overline{red} \,|\, facecard)$

16. Find $P(\text{club} \cup \text{spade})$

17. Find $P(2 \cap \text{facecard})$

18. Find $P(\text{black} \cap 10)$

19. Find $P(4|black)$

20. Find $P(\text{diamond} \cup \text{red})$

21. Find $P(8 \cup red)$

For 22-23, you randomly select 3 cards from a standard well shuffled deck of 52 playing cards.

22. Find the probability that all 3 cards are hearts when you replace each card before selecting the next card.

23. Find the probability that all 3 cards are hearts when you **do not** replace each card before selecting the next card