Prob/Stat/Discrete

Homework 1.4 Name_____

In exercises 1-3, find each of the following sets using,

U = {1, 2, 3, 4, 5, 6, 7}

A = {1, 3, 5, 7}

B = {1, 2, 3}

C = {2, 3, 4, 5, 6}

1. A ∩ (B U C)
2. (C' ∩ A) U (C' ∩ B')
3. (B U C)' ∩ A

In Exercises 4-6, find each of the following sets using,

U = {a, b, c, d, e, f, g, h}

A = {a, g, h}

B = {b, g, h}

C = {b, c, d, e, f}

4. A ∩ (B U C)
5. C' ∩ (A U B')
6. (B U C)' ∩ A

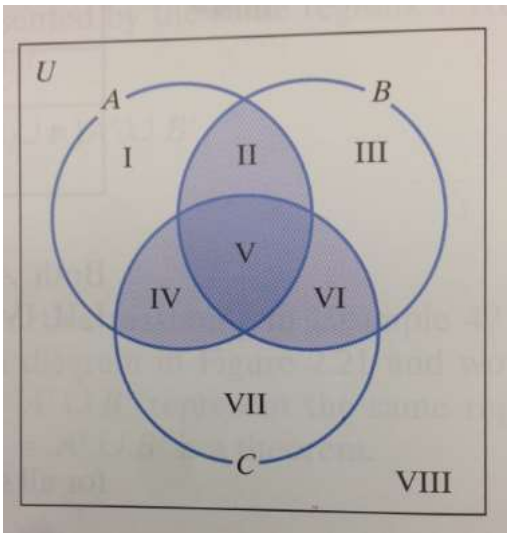
In Exercises 7-10, use the Venn diagram shown to answer each question

7. Which regions represent set C?

8. Which regions represent B U C?

9. Which regions represent A ∩ C?

10. Which regions represent C'?



In Exercises 11-16, use the Venn diagram to represent each set in roster form.

11. B

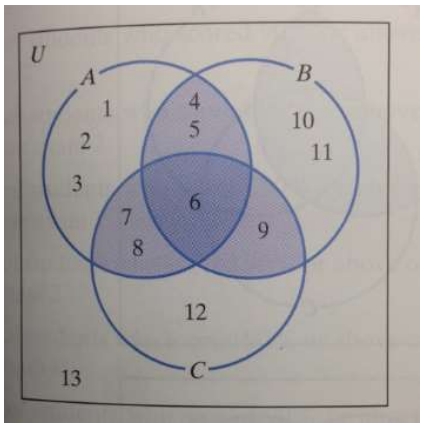
12. B U C

13. (B U C)'

14. A ∩ C

15. A U B U C

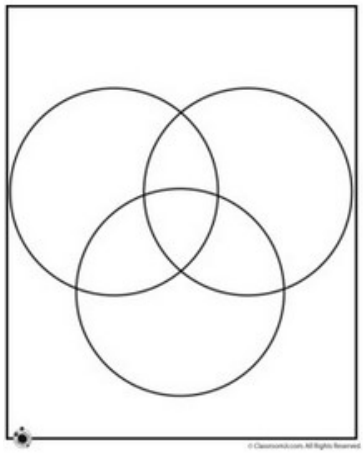
16. (A U B U C)'



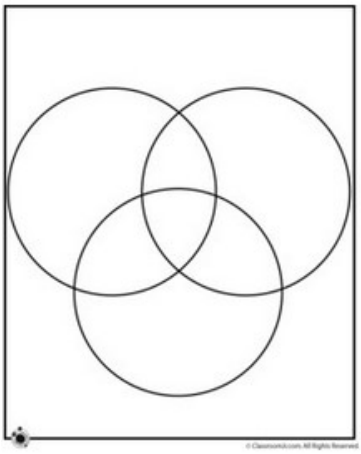
In Exercises 17-18 construct a Venn diagram illustrating the given sets

17. A = { a, e, h, i} , B = {b, c, e, f, h, i} , C = {e, f, g} , U = {a, b, c, d, e, f, g, h, i}
18. U = {x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9} , A = { x_3, x_9} , B ={x_1, x_2, x_3, x_5, x_6} , C = {x_3, x_4, x_5, x_6, x_9}

17.



18.



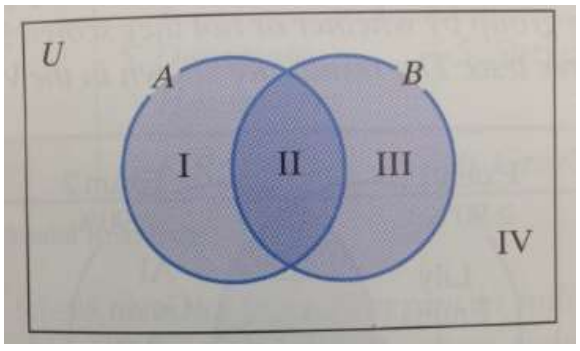
Use the Venn diagram shown to solve Exercises 19-20. (and 21-23)

19. a. Which regions are represented by A U B?
    b. Which regions are represented by B U A?
    c. Based on parts (a) and (b), what can you conclude?

20. a. Which region(s) is/are represented by (A U B)'?

    b. Which region(s) is/are represented by A' U B'?

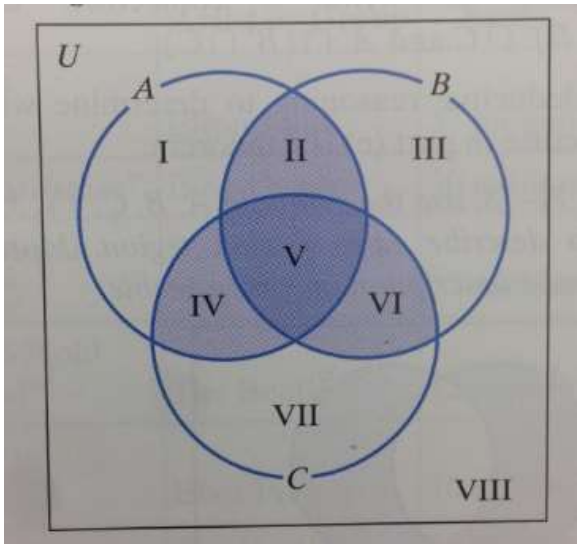
    c. Based on parts (a) and (b), are (A U B)' and A' U B' equal for all sets A and B? Explain your answer.



In Exercises 21-23 Use the Venn diagram for 19-20 to determine whether the given sets are equal for all sets A and B.

21. $A' \cap B$, $A \cup B'$
22. $(A \cup B)'$, $A' \cap B$
23. $(A \cup B')'$, $A' \cap B$

Use the Venn diagram shown to solve Exercises 24-25. (and 26-28)



24. a. Which regions are represented by $(A \cup B) \cap C$?
    b. Which regions are represented by $(A \cap C) \cup (B \cap C)$?
    c. Based on parts (a) and (b), what can you conclude?

25. a. Which regions are represented by $C \cup (B \cap A)$?

    b. Which regions are represented by $C \cap (B \cup A)$?
    c. Based on parts (a) and (b), are $C \cup (B \cap A)$ and $C \cap (B \cup A)$ equal for all sets A, B, and C? Explain your answer.

In Exercises 26-28, use the Venn diagram shown above to determine which statements are true for all sets A, B, and C, and consequently, are theorems.

26. $A \cup (B \cap C) = (A \cup B) \cap C$
27. $B \cap (A \cup C) = (A \cap B) \cup (B \cap C)$
28. $A \cup (B \cap C)' = A \cup (B' \cup C')$