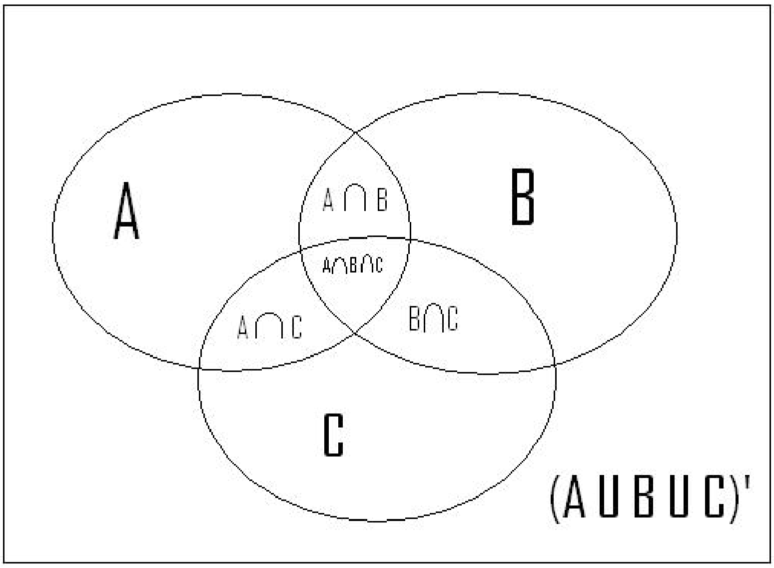
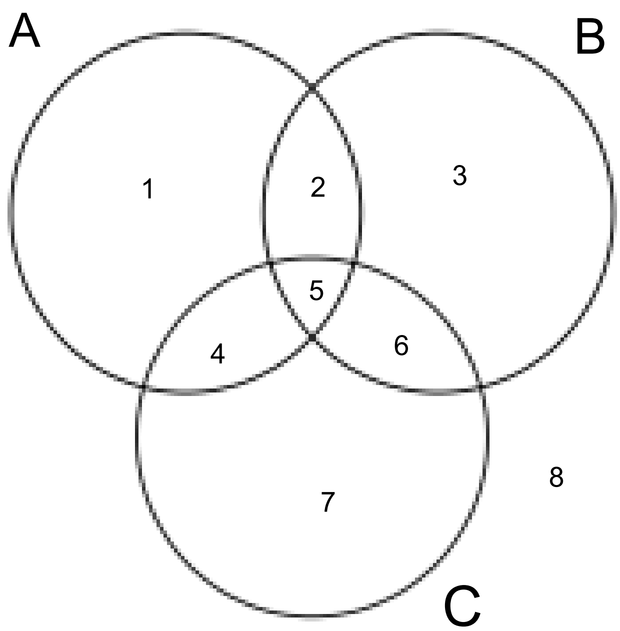
Section 2.4 Venn Diagrams with Three sets and verification of equality of sets.





This is the order in which you fill in the 3 set Venn Diagram.

Region

1. $A \cap B \cap C$ - 5
2. $A \cap B$ - 2
3. $B \cap C$ - 6
4. $A \cap C$ - 4
5. Region 1
6. Region 3
7. Region 7
8. Region 8

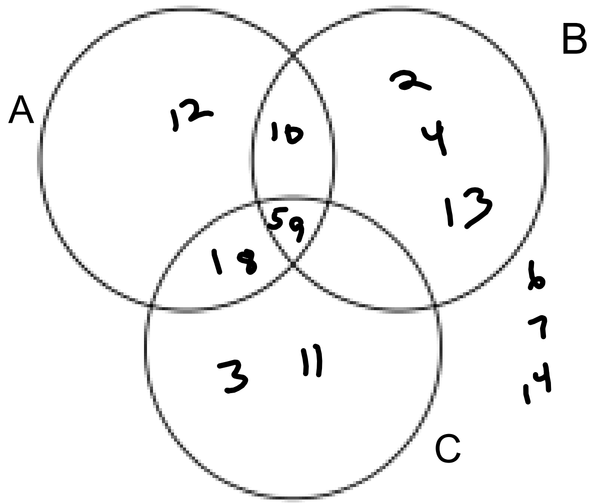
Construct a Venn Diagram for Three Sets.

$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$

$A = \{1, 5, 8, 9, 10, 12\}$

$B = \{2, 4, 5, 9, 10, 13\}$

$C = \{1, 3, 5, 8, 9, 11\}$



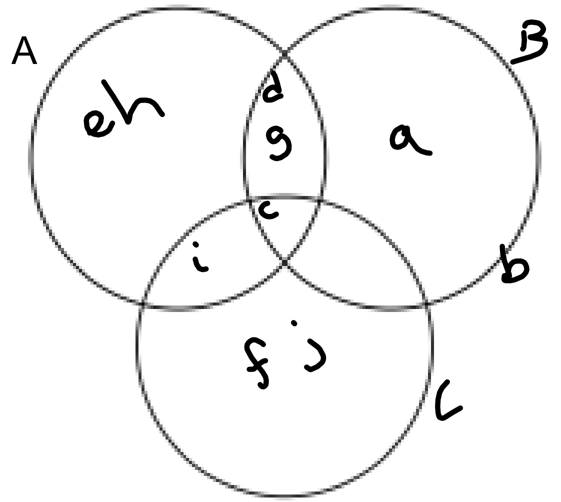
Construct a Venn diagram illustration the following sets.

$U = \{a, b, c, d, e, f, g, h, i, j\}$

$A = \{c, d, e, g, h, i\}$

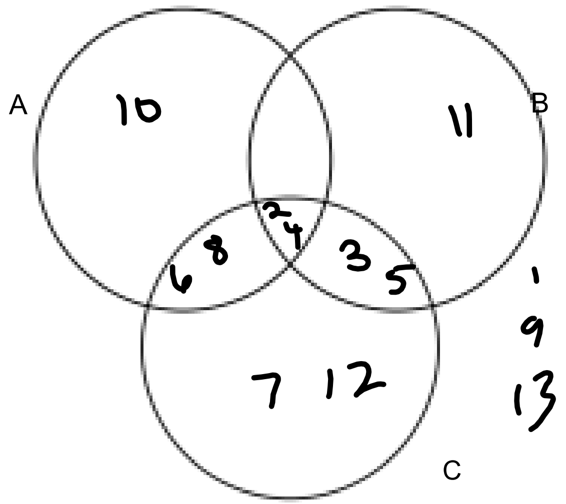
$B = \{a, c, d, g\}$

$C = \{c, f, i, j\}$

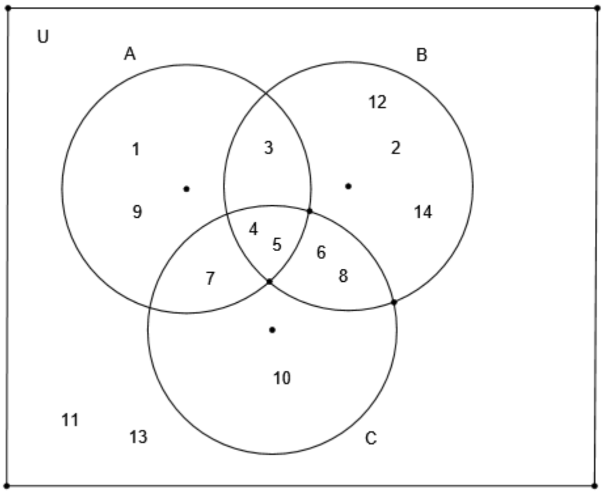


Construct a Venn diagram illustration the following sets.

$$U = \{1,2,3,4,5,6,7,8,9,10,11,12,13\}$$
$$A = \{2,4,6,8,10\}$$
$$B = \{2,3,4,5,11\}$$
$$C = \{2,3,4,5,6,7,8,12\}$$



Use the Venn Diagram to list the sets in foster form.



8. {1 2 3 7 9 10 11 12 13 14}
9. {4 5}
10. {2 3 4 5 6 7 8 10 12 14}
11. {2 11 12 13, 14}
12 {3 4 5 7}
13. {2 6 8 10 11 12 13 14}
14. {11, 13}

3. A {1, 3, 4, 5, 7, 9}

4. U {1 2 3 4 5 6 7 8 9 10 11 12 13 14}

5. B {2 3 4 5 6 8 12 14}

6. C {4 5 6 7 8 10}

7. $A \cap C$ {4 5 7}

8. $(B \cap C)'$

9. $A \cap B \cap C$

10. $B \cup C$

11. $(A \cup C)'$

12. $A \cap (B \cup C)$

13. A'

14. $(A \cup B \cup C)'$

Verification of Sets

Is $A' \cup B = A' \cap B$ *for all sets A and B*?

$U = \{1, 2, 3, 4, 5\}$, $A = \{1, 3\}$, and $B = \{2, 4, 5\}$.

Find $A' \cup B$	**Find $A' \cap B$**

A' $\{2, 4, 5\}$

B $\{2, 4, 5\}$

$\{2, 4, 5\} = \{2, 4, 5\}$

If we select the sets $U = \{1, 2, 3, 4, 5\}$, $A = \{1, 3, 5\}$, and $B = \{2, 3\}$, we see that $A' \cup B = \{2, 3, 4\}$ and $A' \cap B = \{2\}$. For this case, $A' \cup B \neq A' \cap B$. Thus, we have proved that $A' \cup B \neq A' \cap B$ for all sets A and B by using a *counterexample.*