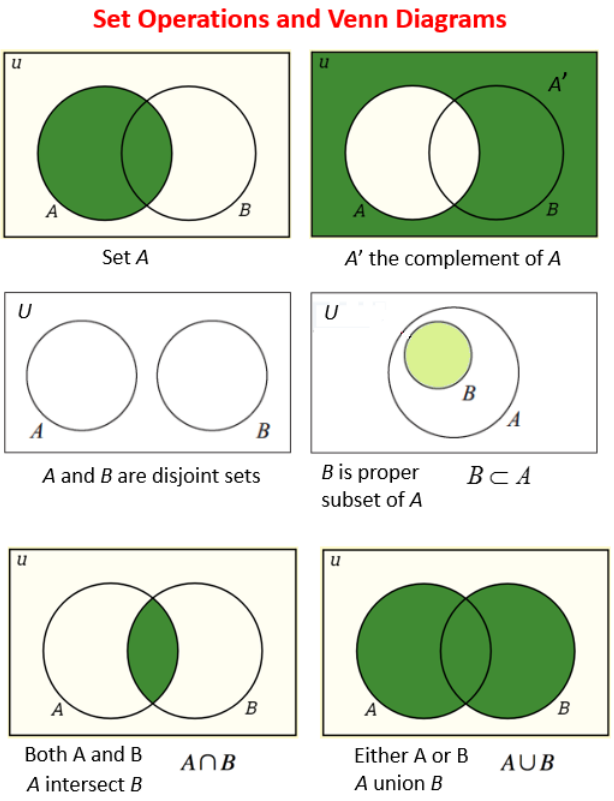
Math 2300: Discrete Mathematics

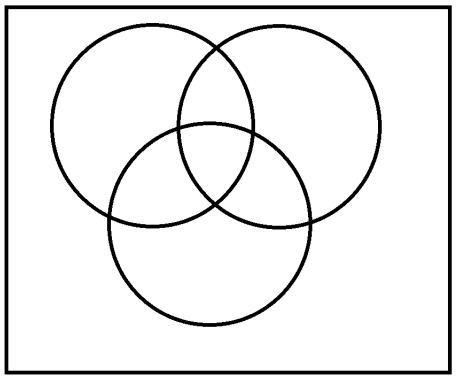
**Set Theory 4 - Venn Diagrams** Textbook Section

## Terms, Concepts, and Examples

- A **Venn Diagram** is a pictorial representation of the relationships between sets.

  We can represent sets using Venn diagrams. In a Venn diagram, the sets are represented by shapes; usually circles or ovals. The elements of a set are labeled within the circle.



- The more sets you are considering, the more circles you need to include in your Venn diagram. A Venn diagram with three sets needs to include intersections of each of the two sets as well as an overlap of all three sets.

Video Example of Venn Diagrams 1
Video Example of Venn Diagrams 2

**Practice Problems**

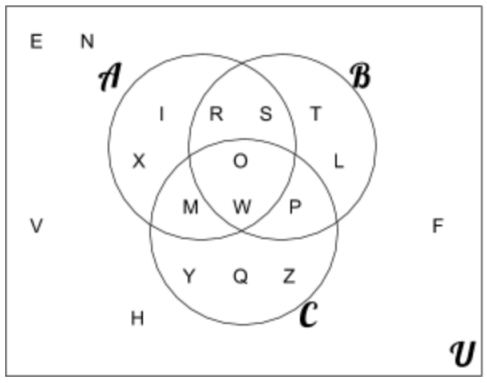
1. Create a Venn diagram to show the relationship among the sets. $U$ is the set of whole numbers from 1 to 15. $A$ is the set of multiples of 3. $B$ is the set of primes. $C$ is the set of odd numbers.

2. Draw Venn diagrams to represent the following.

   (a) $(A \cup B) \cap C$

   (b) $(A \cap \overline{B}) \cup (A \cap \overline{C})$

3. Use the Venn diagram to list the elements of the following sets.




   (a) $(A \cap B) - C$

   (b) $\overline{B} \cap (\overline{A \cap C})$

   (c) $\overline{B} \cup (A \cup C)$

   (d) $(A \cap C) - B$

   (e) $(B \cup C) \cap A$

   (f) $B - (A \cap C)$