MAT2440, Classwork18, Spring2025

ID:_____ Name:_____

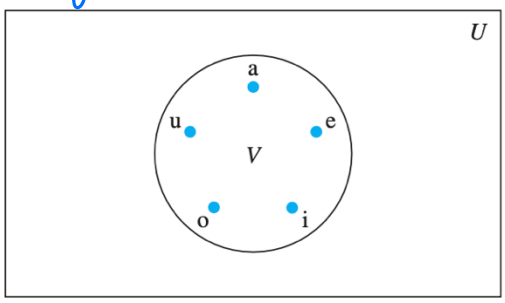
1. The Venn Diagram and the Universal Set U:

   Sets can be represented graphically using __Venn__ Diagram:

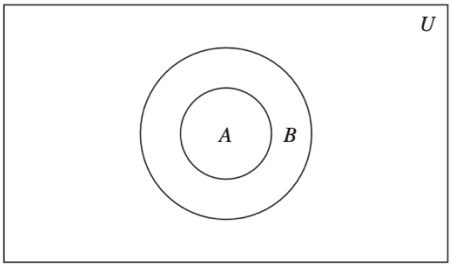
   The __universal__ __set__ U, which contains all the __elements__ __objects__ under consideration, is represented by a __rectangle__.

   Inside this rectangle, __circles__ or other geometrical figures are used to represent sets.

   Example: the Venn diagram for V: the set of vowels in English alphabet.

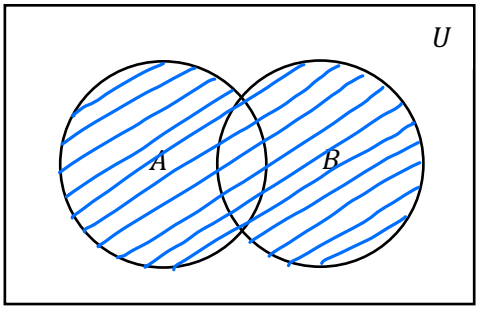


2. If A __$\subseteq$__ B, then the corresponding Venn diagram can be the circle for A within the circle for B.



3. The definition of the **Union** of two sets:

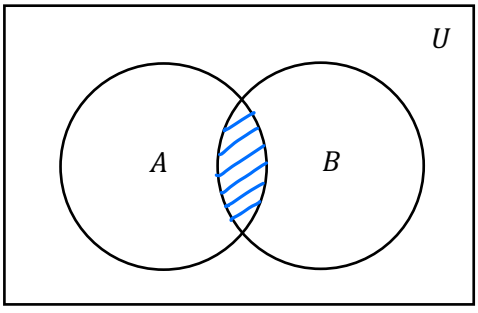
   Let ***A*** and ***B*** be sets. The __union__ of ***A*** and ***B***, denoted by __$A \cup B$__, is the set that contains those elements that are either in __A__ or in __B__, or in __both__. Hence,



$$A \cup B = \{x \mid x \in A \ \underset{\text{or}}{\vee} \ x \in B\}. = B \cup A$$

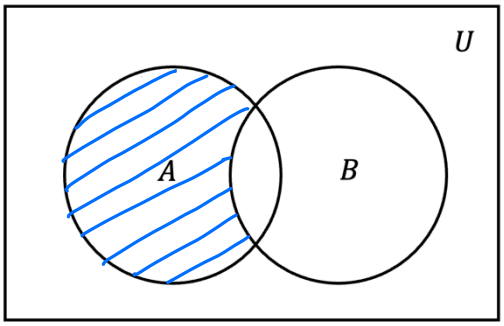
4. The definition of the **Intersection** of two sets:

   Let ***A*** and ***B*** be sets. The __intersection__ of ***A*** and ***B***, denoted by __$A \cap B$__, is the set that contains those elements in __both__ ***A*** and ***B***. Hence,



$$A \cap B = \{x \mid x \in A \ \underset{\text{and}}{\wedge} \ x \in B\}. = B \cap A$$

5. The definition of the **Difference** of two sets:

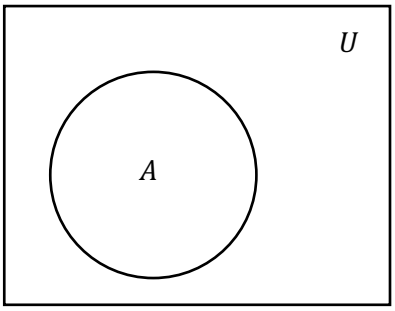


Let ***A*** and ***B*** be sets. The difference of ***A*** and ***B***, denoted by $A-B$ or $A \setminus B$, is the set containing those elements that are in A but not in B. It is also called the difference of B with respect to A. Hence,

$$A - B = \{x \mid x \in A \wedge x \notin B\}.$$

$B - A =$

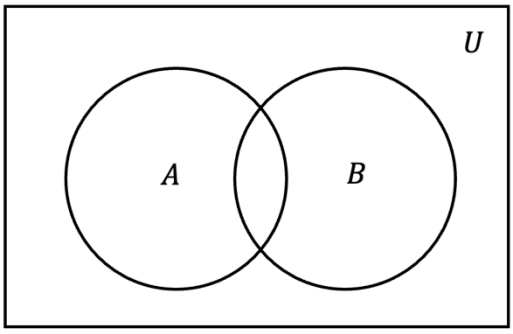
6. The definition of the **Complement** of a set:



Let ***A*** be a set and ***U*** be the universal set. The _____ of A, denoted by _____, is the complement of A with respect to U. Therefore, the complement of A is _____. Hence,

$$\bar{A} = \_\_\_\_\_ = \{x \mid x \in U \wedge x \_\_ A\}.$$

7. Let ***A*** and ***B*** be sets. Shade the Venn diagram for $B - A$.



8. The definition of Disjoint:

Two sets are called _____ if their intersection is the _____ set.