

# Assignment FOUR

▼ Let the universal set be the set  $R$  of all real numbers and let  $A = \{x \in R \mid 0 < x \leq 2\}$ , and  $B = \{x \in R \mid 1 \leq x < 4\}$

$$A=\{1,2\}$$

$$B=\{1,2,3\}$$

- d.  $B^c$

$$B^c = \{x \in R \mid x < 1 \text{ or } x \geq 4\}$$

$$(-\infty, 1) \cup [4, +\infty)$$

- e.  $A^c \cap B^c$

$$A^c \cap B^c = \{x \in R \mid x \leq 0 \text{ or } x \geq 4\}$$

$$(-\infty, 0] \cup [4, +\infty)$$

- f.  $A^c \cup B^c$

$$A^c \cup B^c = \{x \in R \mid x \leq 0 \text{ or } x \geq 4\}$$

$$(-\infty, 0] \cup [4, +\infty)$$

- g.  $(A \cap B)^c$

$$(A \cap B)^c = \{x \in R \mid x < 1 \text{ or } x > 2\}$$

$$(-\infty, 1) \cup (2, +\infty)$$

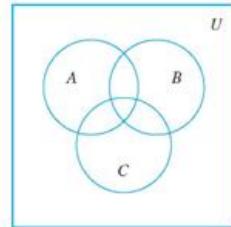
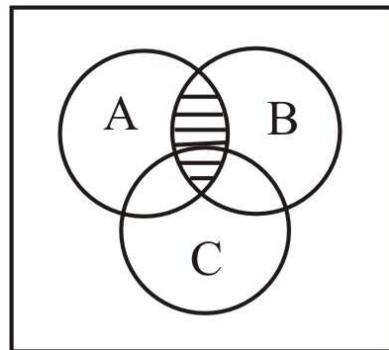
- h.  $(A \cup B)^c$

$$(A \cup B)^c = \{x \in R \mid x < 1 \text{ or } x > 4\}$$

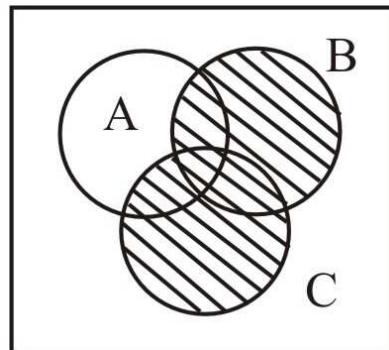
$$(-\infty, 1) \cup (4, \infty)$$

▼ Consider the following Venn diagram, Copy this diagram and shade the region corresponding to the indicated set

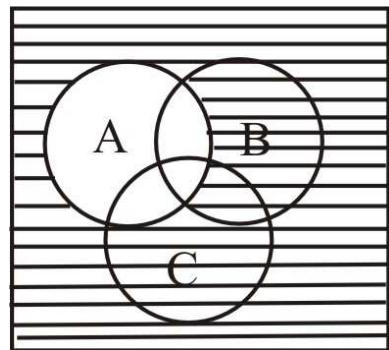
a.  $A \cap B$



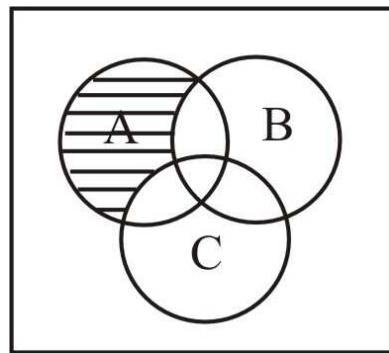
b.  $B \cup C$



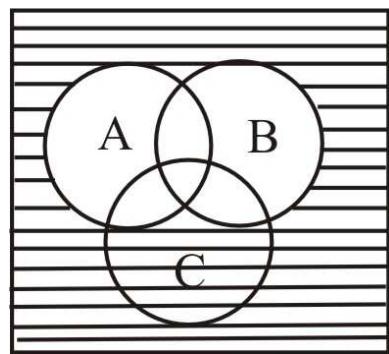
c.  $A \cap C$



d.  $A - (B \cup C)$



e.  $(A \cup B)^c$



▼ Derive each of the set properties given in Theorem  
**5.2.1 – 5.2.3 and 5.3.3:**

c. For all sets A, B, and C,  $(A - B) \cup (B - C) = (A \cup B) - (A \cap B)$

d. For all sets A and B,  $A \cup (B - A) = A \cup B$