

Proving Set Operations

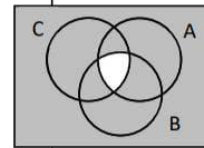
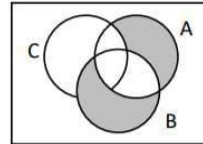
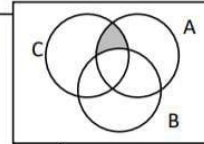
• **Exercise:** Prove the followings by using common set operation rules and by set membership tables:

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

• **Exercise:** Draw Venn diagram for

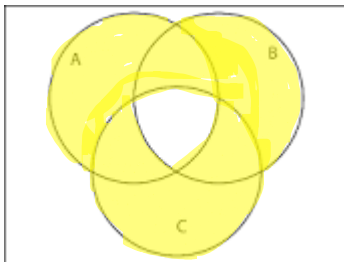
- $\overline{A \cap B \cap C}$
- $(A-B) \cup (B-A)$
- $(A \cap B) \cup \overline{A}$

• **Exercise:** Write the expressions for the shaded area of these three Venn diagrams

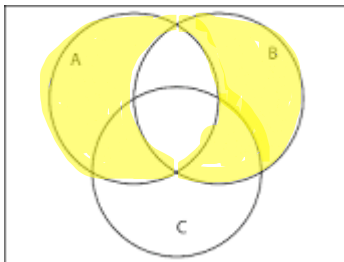


Exercise: Draw Venn Diagram

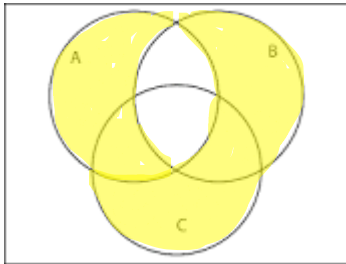
$$(A \cap B \cap C)^c$$



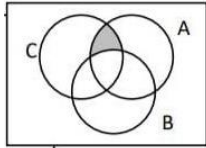
$$(A - B) \cup (B - A)$$



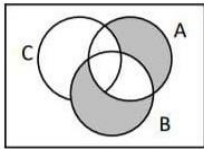
$$(A - B) \cup A^c$$



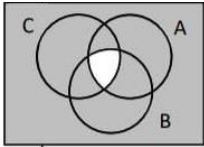
Exercise: Write the expressions



$$A \cap C$$



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



$$(A \cap B \cap C)^c$$