

TOPIC: VENN DIAGRAMS & OPERATIONS WITH THREE SETS

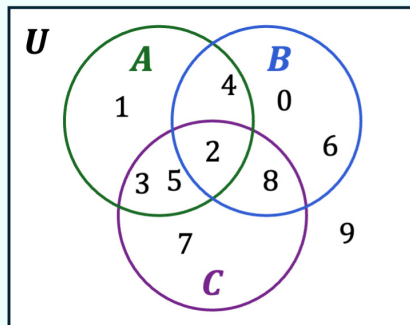
Venn Diagrams & Operations With Three Sets

◆ All set operations can also be applied to 3 or more sets.

EXAMPLE

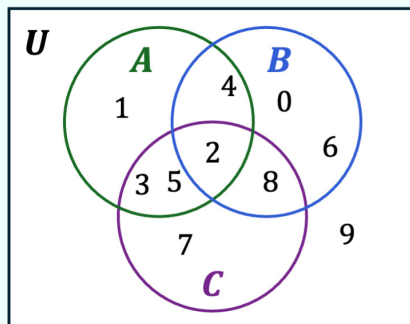
Using $U = \{0, 1, 2, 3, \dots, 9\}$, $A = \{1, 2, 3, 4, 5\}$, $B = \{0, 2, 4, 6, 8\}$, $C = \{2, 3, 5, 7, 8\}$, find each of the following sets.

(A)



$$A \cap B \cap C$$

(B)

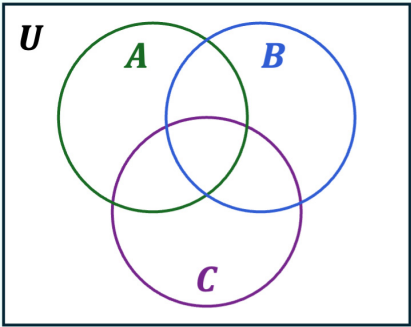


$$A \cup (B \cap C)$$

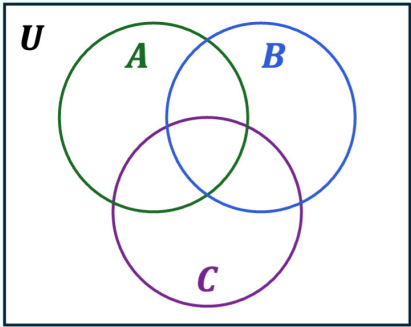
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EXAMPLE Shade each of the following on the Venn diagrams.

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



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



(C) What can you conclude about the relationship between $(B \cup C) \cap A'$ and $(B \cap A') \cup (C \cap A')$?

PRACTICE Write the specified set using the roster method given
 $U = \{1, 2, 3, \dots, 20\}$, $E = \{2, 4, 6, \dots, 20\}$, $F = \{5, 10, 15, 20\}$, $G = \{1, 2, 3, 4, 5\}$.

(A) $(E \cup F \cup G)'$

(B) $(E \cup F) \cap (F \cup G)$

(C) $F' \cap (E \cup G')$

(D) $(E \cap F') \cup (G' \cap F')$

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PRACTICE

Use the Venn diagram to find each of the following.

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

(B) $A' \cap B' \cap C'$

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

