



Sets Ex 1.5 Q4

We have,

$$A = \{3, 6, 12, 15, 18, 21\}$$

$$B = \{4, 8, 12, 16, 20\}$$

$$C = \{2, 4, 6, 8, 10, 12, 14, 16\}$$

$$D = \{5, 10, 15, 20\}$$

If A and B are two sets, then the set $A - B$ is defined as

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

$$(i) \quad A - B = \{x \in A : x \notin B\} = \{3, 6, 15, 18, 21\}$$

$$(ii) \quad A - C = \{x \in A : x \notin C\} = \{3, 15, 18, 21\}$$

$$(iii) \quad A - D = \{x \in A : x \notin D\} = \{3, 6, 12, 18, 21\}$$

$$(iv) \quad B - A = \{x \in B : x \notin A\} = \{4, 8, 16, 20\}$$

$$(v) \quad C - A = \{x \in C : x \notin A\} = \{2, 4, 8, 10, 14, 16\}$$

$$(vi) \quad D - A = \{x \in D : x \notin A\} = \{5, 10, 20\}$$

$$(vii) \quad B - C = \{x \in B : x \notin C\} = \{20\}$$

$$(viii) \quad B - D = \{x \in B : x \notin D\} = \{4, 8, 12, 16\}$$

Sets Ex 1.5 Q5

(i)

$$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}, C = \{3, 4, 5, 6\}$$

By the complement of a set A , which respect to the universal set U , denoted by A' or A^c or $U - A$, we mean $\{x \in U : x \notin A\}$.

$$\text{Hence, } A' = \{x \in U : x \notin A\} = \{5, 6, 7, 8, 9\}$$

$$(ii) \quad B' = \{x \in U : x \notin B\} = \{1, 3, 5, 7, 9\}$$

$$(iii) \quad (A \cap C)' = \{x \in U : x \notin A \cap C\}$$

Now,

$$A \cap C = \{x : x \in A \text{ and } x \in C\} = \{3, 4\}$$

$$\therefore (A \cap C)' = \{1, 2, 5, 6, 7, 8, 9\}$$

Sets Ex 1.5 Q6

(i)

$$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$A = \{2, 4, 6, 8\}$$

$$B = \{2, 3, 5, 7\}$$

We have,

$$\begin{aligned} A \cup B &= \{x : x \in A \text{ or } x \in B\} \\ &= \{2, 3, 4, 5, 6, 7, 8\} \end{aligned}$$

$$\begin{aligned} \therefore (A \cup B)' &= \{x \in U : x \notin A \cup B\} \\ &= \{1, 9\} \end{aligned}$$

$$\begin{aligned} A' &= \{x \in U : x \notin A\} \\ &= \{1, 3, 5, 7, 9\} \end{aligned}$$

$$\begin{aligned} B' &= \{x \in U : x \notin B\} \\ &= \{1, 4, 6, 8, 9\} \end{aligned}$$

$$\text{Hence, } A' \cap B' = \{1, 9\}$$

$$\text{Hence, } (A \cup B)' = A' \cap B' = \{1, 9\}$$

(ii)

$$\begin{aligned} A \cap B &= \{x : x \in A \text{ and } x \in B\} \\ &= \{2\} \end{aligned}$$

$$\begin{aligned} \therefore (A \cap B)' &= \{x \in U : x \notin A \cap B\} \\ &= \{1, 3, 4, 5, 6, 7, 8, 9\} \end{aligned}$$

Also,

$$\begin{aligned} A' \cup B' &= \{x : x \in A' \text{ or } x \in B'\} \\ &= \{1, 3, 4, 5, 6, 7, 8, 9\} \end{aligned}$$

$$\text{Hence, } (A \cap B)' = A' \cup B' = \{1, 3, 4, 5, 6, 7, 8, 9\}$$

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