

**General instructions for Students:** Whatever be the notes provided, everything must be copied in the Mathematics copy and then do the HOMEWORK in the same copy.

**CLASS – VIII**

**6. OPERATIONS ON SETS: VENN DIAGRAMS (PART – I)**

**MATHS**

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**EXERCISE – 6.1**

1. If  $A = \{0, 1, 2, 3, \dots, 8\}$ ,  $B = \{3, 5, 7, 9, 11\}$  and  $C = \{0, 5, 10, 20\}$ , find

(i)  $A \cup B$                       (iv)  $A \cap B$

Also find their cardinal number.

**Solution:** Given  $A = \{0, 1, 2, 3, \dots, 8\}$ ,  $B = \{3, 5, 7, 9, 11\}$  and  $C = \{0, 5, 10, 20\}$

(i)  $A \cup B = \{0, 1, 2, 3, \dots, 8\} \cup \{3, 5, 7, 9, 11\} = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 11\}$  **Ans.**

(iv)  $A \cap B = \{0, 1, 2, 3, \dots, 8\} \cap \{3, 5, 7, 9, 11\} = \{3, 5, 7\}$  **Ans.**

2. Find  $A'$  when

(iv)  $A = \{\text{letters of KALKA}\}$  and  $\xi = \{\text{letters of KOLKATA}\}$

**Solution:**  $A = \{\text{letters of KALKA}\} = \{K, A, L\}$

$\xi = \{\text{letters of KOLKATA}\} = \{K, O, L, A, T\}$

$A' = \{O, T\}$  **Ans.**

3. If  $A = \{x : x \in \mathbb{N} \text{ and } 3 < x < 7\}$  and  $B = \{x : x \in \mathbb{W} \text{ and } x \leq 4\}$ , find

(iii)  $A - B$

(iv)  $B - A$

**Solution:**  $A = \{x : x \in \mathbb{N} \text{ and } 3 < x < 7\} = \{4, 5, 6\}$

$B = \{x : x \in \mathbb{W} \text{ and } x \leq 4\} = \{0, 1, 2, 3, 4\}$

(iii)  $A - B = \{5, 6\}$  **Ans.**

(iv)  $B - A = \{0, 1, 2, 3\}$  **Ans.**

5. If  $A = \{\text{letters of word INTEGRITY}\}$  and  $B = \{\text{letters of word RECKONING}\}$ , find

(i)  $A \cup B$     (ii)  $A \cap B$     (iii)  $A - B$     (iv)  $B - A$

Also verify that (a)  $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

(d)  $n(A \cup B) = n(A - B) + n(B - A) + n(A \cap B)$

**Solution:**  $A = \{\text{letters of word INTEGRITY}\} = \{I, N, T, E, G, R, Y\} \Rightarrow n(A) = 7$

$B = \{\text{letters of word RECKONING}\} = \{R, E, C, K, O, N, I, G\} \Rightarrow n(B) = 8$

(i)  $A \cup B = \{I, N, T, E, G, R, Y, C, K, O\}$

$$\Rightarrow n(A \cup B) = 10$$

(ii)  $A \cap B = \{I, N, E, G, R\}$

$$\Rightarrow n(A \cap B) = 5$$

(iii)  $A - B = \{T, Y\}$

$$\Rightarrow n(A - B) = 2$$

(iv)  $B - A = \{C, K, O\}$

$$\Rightarrow n(B - A) = 3$$

(a)  $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

$$\text{LHS} \Rightarrow n(A \cup B) = 10$$

$$\text{RHS} \Rightarrow n(A) + n(B) - n(A \cap B) = 7 + 8 - 5 = 10$$

Hence,  $\text{LHS} = \text{RHS}$  **Verified**

(d)  $n(A \cup B) = n(A - B) + n(B - A) + n(A \cap B)$

$$\text{LHS} \Rightarrow n(A \cup B) = 10$$

$$\text{RHS} \Rightarrow n(A - B) + n(B - A) + n(A \cap B) = 2 + 3 + 5 = 10$$

Hence,  $\text{LHS} = \text{RHS}$  **Verified**

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## **HOMEWORK**

### **EXERCISE – 6.1**

**QUESTION NUMBERS: 1(ii), (v); 2(iii), (iv), (v); 4, 5(c) and 6**

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