(8) Write an example of a finite and infinite set in set-builder form.

Ans:- Finite set, $A = \{x : x \in \mathbb{N} \text{ and } (x-1)(x-2) = 0\}$

Infinite set, $B = \{x : x \in \mathbb{N} \text{ and } x \text{ is prime}\}$.

(9) Write an example of equal sets.

Ans:- Let there be two sets A and B.

A is the set of letters in "ALLOY".

B is the set of letters in "LOYAL".

Hence, $A = \{A, L, L, O, Y\}$, $B = \{L, O, Y, A, L\}$.

∴ Both the sets have the same element, hence $A = B$.

Q) Write the subsets of $\{1, 2, 3\}$.

Ans:- Let $A = \{1, 2, 3\}$.

Therefore the subsets of A are, $\phi, \{1\}, \{2\}, \{3\}, \{1, 2\}, \{2, 3\}$, $\{1, 3\}, \{1, 2, 3\}$.

Q) Write $\{x : x \in \mathbb{R}, 3 \leq x \leq 4\}$ and intervals.

Ans:- $\{x : x \in \mathbb{R}, 3 \leq x \leq 4\} = [3, 4]$.

Q) Write the interval $(6, 12)$ in set builder form.

Ans:- Let A be the interval $(6, 12)$.

The interval $(6, 12)$ in set builder form is,

$A = \{x : x \in \mathbb{R}, 6 < x < 12\}$

Q) If set $A = \{1, 3, 5\}$, $B = \{2, 4, 6\}$, and $C = \{0, 2, 4, 6, 8\}$. Then write the universal sets for all three sets.

Ans:- If U be the universal set for A, B, C, we have,

$U = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

Q) If $A = \{2, 4, 6, 8\}$ and $B = \{6, 8, 10\}$

Find $A \cup B$.

Ans:- $A \cup B = \{2, 4, 6, 8, 10\}$.

Q) If $A = \{3, 5, 7, 9, 11\}$, $B = \{7, 9, 11, 13\}$ and $C = \{11, 13, 15\}$. Find $A \cap (B \cup C)$.

Ans:- Now, $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

$= \{7, 9, 11\} \cup \{11\} = \{7, 9, 11\}$.

Q) If $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{2, 4, 6, 8\}$.
Find $A - B$ and $B - A$.

Ans $A - B = \{1, 3, 5\}$

$B - A = \{8\}$, Clearly $A - B \neq B - A$.

Q) If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
and $A = \{1, 3, 5, 7, 9\}$. Find A'.

Ans:- $A' = \{2, 4, 6, 8, 10\}$.

Q) Write the solution set of the equation $x^2 - 4 = 0$ in roster form.

Ans:- Now, $x^2 - 4 = (x+2)(x-2)$

$\therefore x = -2, +2$.

Thus $A = \{-2, 2\}$.