Ex - 6 (A)

(1) write the following sets in roaster (Tabular) form.

(i) $A_1 = \{x : 2x + 3 = 11\}$

$\Rightarrow$ $2x + 3 = 11$

$= 2x = 11 - 3$

$= 2x = 8$

$x = \frac{8}{2} = 4$

$\therefore$ Given set in roaster (Tabular) form is

$\{A_1 = 4\}$

(ii) $A_2 = \{x : x^2 - 4x - 5 = 0\}$

$= x^2 - 4x - 5 = 0$

$= x^2 - 5x + x - 5 = 0$

$= x(x-5) + 1(x-5) = 0$

$= (x-5)(x+1) = 0$

Either $x - 5 = 0$ or $x + 1 = 0$

$\Rightarrow x = 5$ $\quad\quad$ $\Rightarrow x = -1$

$\therefore$ Given set in roaster (tabular) form is

$A_2 = \{5, -1\}$

(2) write the following sets in sets builder form.

(i) $B_1 = \{6, 9, 12, 15, \ldots\}$

$= \{x : x = 3n+3 \; ; \; n \in N\}$

(ii) $B_2 = \{11, 13, 17, 19\}$

$= \{x : x$ is a prime number between 10 and 20$\}$

(iii) $B_3 = \left\{\frac{1}{3}, \frac{3}{5}, \frac{5}{7}, \frac{7}{9}, \frac{9}{11}, \right\}$

$= \left\{x ; x = \frac{n}{n+2}, \text{ where } n \text{ is an odd natural number}\right\}$

(iv) $B_4 = \{8, 27, 64, 125, 216\}$

$= \{x : x = n^3 : n \in N \text{ and } 2 \leq n \leq 6\}$

(v) $B_5 = \{-5, -4, -3, -2, -1\}$

$= \{x : x \in Z, -5 \leq x \leq -1\}$

(vi) $B_6 = \{\ldots, -6, -3, 0, 3, 6, \ldots\}$

$= \{x : x = 3n, n \in Z\}$

Q.4) write the following sets in roster form.

(ii) The set of letters in a world 'UNIVERSAL'.

→ {U, N, I, V, E, R, S, A, L}

(iii) $A = \{x : x = y + 3, y \in N \text{ and } y > 3\}$

→ when $y = 4$

$x = 4 + 3 = 7$

when $y = 5$

$x = 5 + 3 = 8$

when $y = 6$

$x = 6 + 3 = 9$

So, $A = \{7, 8, 9, \ldots\}$

(iv) $B = \{p : p \in W \text{ and } p^2 < 20\}$.

→ $p^2 < 20$, $p \in W$

$p < \sqrt{20}$, $p^2 = 0$

$p = \sqrt{0} = 0$

$p^2 = 1$

$p^2 = \sqrt{1} = 1$

$p^2 = 4$

$p^2 = \sqrt{4} = 2$

$p^2 = 9$

$p = \sqrt{9} = 3$

$p^2 = 16$

$p = \sqrt{16} = 4$

$5^2 = 25$ $(p^2 < 20)$

Ex-6(B)

(1) Find the cardinal number of the following sets.

(i) $A_1 = \{x : x, -2, -1, 1, 3, 5\}$

$= x$ * $n(A_1) = 5$.

(ii) $A_2 = \{x : x \in N \text{ and } 3 \leq x \leq 7\}$

$\rightarrow x = \{3, 4, 5, 6\}$

$n(A_2) = 4$.

(iii) $A_3 = \{p : p \text{ wand } 2p - 3 < 8\}$

$= 2p - 3 < 8$

$2p < 8 - 3$

$2p < 11$

$P < 11/2$

$P = 5.5$

$P = \{0, 1, 2, 3, 4, 5\}$, $n(P) = 6$.

(iv) $A_4 = \{b : b \in Z \text{ and } -7 < 3b - 1 \leq 2\}$

$= -7 < 3b - 1 \leq 2$

$= -7 + 1 < 3b \leq 2 + 1$

$= -6 < 3b \leq 3$

$= \frac{-6}{3} < b \leq \frac{3}{3}$

$= -2 < b \leq 1$

$= b = \{-1, 0, 1\}$

$= n(A_4) = 3$

$-7 < 3b - 1$ | $3b - 1 \leq 2$

$-7 + 1 < 3b$ | $3b \leq 2 + 1$

$-6 = 3b$, $\frac{-6}{3} = b$

(3) State, which of the following are sets are finite and which are infinite.

(i) $A = \{x : x \in Z \text{ and } x < 10\}$

$\rightarrow x < 10$

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

yes, this set is an infinite set.

(ii) $B = \{x : x \in W \text{ and } 5x - 3 \leq 20\}$

$\rightarrow 5x \leq 20 + 3$

$= 5x \leq 23$

$= x \leq \frac{23}{5}$

$= x \leq 4.6$.

$B = \{0, 1, 2, 3, 4\}$ No, it's a finite set.

(iii) $P = \{y : y = 3x - 2, x \in N \text{ and } x > 5\}$

$\rightarrow 3x - 2 \quad , \quad x > 5$

$= 3 \times 6 - 2 = 18 - 2 = 16$

$3 \times 7 - 2 = 19$

$3 \times 8 - 2 = 22$

$p = \{16, 19, 22, \ldots\}$

yes, it is an infinite set.