Ex - 4.2

Q1. Which one of the following statements is true, and why?

$y = 3x + 5$ has

(i) A unique solution

(ii) Only two solutions

(iii) Infinitely many solutions.

Sol. Option (iii) is true because a linear equation has an infinitely many solutions. Moreover when represented graphically a linear equation in two variable is a straight line which has infinite points and hence, it has infinite solutions.

Q2. Write four solutions for each of the following equations :

(i) $2x + y = 7$ (ii) $\pi x + y = 9$ (iii) $x = 4y$

Sol. (i) $2x + y = 7$

For $x = -1$, we get $-2 + y = 7$, i.e., $y = 9$

$\therefore$ $(-1, 9)$ is a solution.

For $x = 0$, we get $y = 7$

$\therefore$ $(0, 7)$ is a solution.

For $x = 1$, we get $2 + y = 7$, i.e., $y = 5$

$\therefore$ $(1, 5)$ is a solution.

For $x = 2$, we get $4 + y = 7$, i.e., $y = 3$

$\therefore$ $(2, 3)$ is a solution.

Hence, we have four solutions $(-1, 9)$, $(0, 7)$, $(1, 5)$ and $(2, 3)$

(ii) Proceed as in (i) and we can have four solutions as $(0, 9)$, $(1, 9 - \pi)$, $(2, 9 - 2\pi)$ and $(3, 9 - 3\pi)$.

(iii) Proceed as in (i) and we can have four solutions as $(0, 0)$, $(4, 1)$, $(8, 2)$ and $(12, 3)$

Q3. Check which of the following are solutions of the equation $x - 2y = 4$ and which are not

(i) $(0, 2)$ (ii) $(2, 0)$ (iii) $(4, 0)$

(iv) $\left(\sqrt{2}, 4\sqrt{2}\right)$ (v) $(1, 1)$

Sol. (i) Substituting $x = 0$, $y = 2$ in the equation $x - 2y = 4$, we get $0 - 2(2) = 4$, i.e., $-4 = 4$ but $-4 \neq 4$

$\therefore$ $(0, 2)$ is not a solution

(ii) $2 - 2(0) \neq 4$

$\therefore$ (2, 0) is not a solution.

(iii) Substituting $x = 4$ and $y = 0$ in the equation $x - 2y = 4$, we get

L.H.S. $= 4 - 2(0) = 4 - 0 = 4 =$ R.H.S.

$\therefore$ L.H.S. = R.H.S.

$\therefore$ (4, 0) is a solution.

(iv) $\sqrt{2} - 2(4\sqrt{2}) = 4$, i.e., $\sqrt{2} - 8\sqrt{2} = 4$,

i.e., $-7\sqrt{2} = 4$ but $-7\sqrt{2} \neq 4$

$\therefore$ $(\sqrt{2}, 4\sqrt{2})$ is not a solution

(v) $1 - 2(1) \neq 4$

$\therefore$ (1, 1) is not a solution.

Q4. Find the value of k if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$.

Sol. (2) (2) + (3) (1) = k, i.e., 4 + 3 = k, i.e., k = 7.