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Linear equation in two variables

Ex - 4.2 Based Questions and Answers

(1) Write four solutions for each of the following equations.

(i) $2x + y = 7$ — (1)

x	0	1	4	-1
y	7	5	-1	9

Putting $x = 0$ in eq (1)

$2x + y = 7$

$\Rightarrow 2(0) + y = 7$

$\Rightarrow 0 + y = 7$

$\Rightarrow y = 7$

Putting $x = 1$ in eq (1)

$2x + y = 7$

$\Rightarrow 2(1) + y = 7$

$\Rightarrow 2 + y = 7$

$\Rightarrow y = 7 - 2$

$\Rightarrow y = 5$

Putting $x = 4$ in eq (1)

$2x + y = 7$

$\Rightarrow 2(4) + y = 7$

$\Rightarrow 8 + y = 7$

$\Rightarrow y = 7 - 8$

$\Rightarrow y = -1$

Putting $x = -1$ in eq (1)

$2x + y = 7$

$\Rightarrow 2(-1) + y = 7$

$\Rightarrow -2 + y = 7$

$\Rightarrow y = 7 + 2$

$\Rightarrow y = 9$

$\therefore$ Four solutions of the given equation (1), are $(0, 7)$, $(1, 5)$, $(4, -1)$ and $(-1, 9)$

(ii) $x = 2$ —— (1)

Solution,

writting $x = 2$ in two variables we get

$1 \cdot x + 0 \cdot y = 2$.

So, Here all values of y are permissible because $0 \cdot y$ is always 0.

x	2	2	2	2
y	0	−1	6	8

So, Any four solutions of eq (1) are,

(2, 0), (2, −1), (2, 6) and (2, 8)

(2) check whether $(\sqrt{3}, 2\sqrt{3})$ is a solution of $x - y = \sqrt{3}$?

Ans, Putting $x = \sqrt{3}$, $y = 2\sqrt{3}$ in the equation $x - y = \sqrt{3}$, we get

L.H.S

$= x - y$

$= \sqrt{3} - 2\sqrt{3}$

$= -\sqrt{3}$

R.H.S

$= \sqrt{3}$

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

$\therefore x = \sqrt{3}$, $y = 2\sqrt{3}$ doesnot satisfy $x - y = \sqrt{3}$.

So, $(\sqrt{3}, 2\sqrt{3})$ is not a solution of given equation.

(3) If the graph $2x + ky = 10k$ intersects x-axis at $(2,0)$, find k.

Solution,

Since graph $2x + ky = 10k$ intersects x-axis at $(2,0)$.

So, $(2,0)$ is a solution of given equation.

$$2x + ky = 10k \quad \text{—— (1)}$$

Putting $x = 2, y = 0$ in eq (1) we get

$$\Rightarrow (2 \times 2) + (k \times 0) = 10k$$

$$\Rightarrow 4 + 0 = 10k$$

$$\Rightarrow 4 = 10k$$

$$\Rightarrow \frac{4}{10} = k$$

$$\Rightarrow k = \frac{\cancel{4}\ 2}{\cancel{10}\ 5}$$

$\therefore$ The value of k is $\frac{2}{5}$.