Linear Equations in Two Variables

CHAPTER 4

NCERT FOCUS

SOLUTIONS

EXERCISE - 4.1

1. Let the cost of a note book = ₹ x
and the cost of a pen = ₹ y
According to the condition, we have
[Cost of a notebook] = 2 × [Cost of a pen]
i.e. $(x) = 2 \times (y) \Rightarrow x = 2y \Rightarrow x - 2y = 0$
Thus, the required linear equation is $x - 2y = 0$.

2. (i) We have, $2x + 3y = (9.3\overline{5})$

$\Rightarrow 2x + 3y + (-9.3\overline{5}) = 0$

Comparing it with $ax + by + c = 0$, we get $a = 2$, $b = 3$ and $c = -9.3\overline{5}$.

(ii) We have, $x - \frac{y}{5} - 10 = 0$

$\Rightarrow x + \left(-\frac{1}{5}\right)y + (-10) = 0$

Comparing it with $ax + by + c = 0$, we get

$a = 1,\ b = -\frac{1}{5}$ and $c = -10$

(iii) We have, $-2x + 3y = 6$
$\Rightarrow (-2)x + 3y + (-6) = 0$
Comparing it with $ax + by + c = 0$, we get $a = -2$, $b = 3$ and $c = -6$.

(iv) We have, $x = 3y \Rightarrow x + (-3)y + 0 = 0$
Comparing it with $ax + by + c = 0$, we get $a = 1$, $b = -3$ and $c = 0$.

(v) We have, $2x = -5y \Rightarrow 2x + 5y + 0 = 0$
Comparing it with $ax + by + c = 0$, we get $a = 2$, $b = 5$ and $c = 0$.

(vi) We have, $3x + 2 = 0 \Rightarrow 3x + 0y + 2 = 0$
Comparing it with $ax + by + c = 0$, we get $a = 3$, $b = 0$ and $c = 2$.

(vii) We have, $y - 2 = 0 \Rightarrow 0x + 1y + (-2) = 0$
Comparing it with $ax + by + c = 0$, we get $a = 0$, $b = 1$ and $c = -2$.

(viii) We have, $5 = 2x \Rightarrow 5 - 2x = 0$
$\Rightarrow -2x + 0y + 5 = 0 \Rightarrow (-2)x + 0y + 5 = 0$
Comparing it with $ax + by + c = 0$, we get $a = -2$, $b = 0$ and $c = 5$.

EXERCISE - 4.2

1. Option (iii) is true. For every value of x, we get a corresponding value of y and vice-versa. Therefore, the linear equation has infinitely many solutions.

2. (i) $2x + y = 7$
When $x = 0$, $2(0) + y = 7 \Rightarrow 0 + y = 7 \Rightarrow y = 7$
$\therefore$ Solution is (0, 7).
When $x = 1$, $2(1) + y = 7 \Rightarrow y = 7 - 2 \Rightarrow y = 5$
$\therefore$ Solution is (1, 5).
When $x = 2$, $2(2) + y = 7 \Rightarrow y = 7 - 4 \Rightarrow y = 3$
$\therefore$ Solution is (2, 3).
When $x = 3$, $2(3) + y = 7 \Rightarrow y = 7 - 6 \Rightarrow y = 1$
$\therefore$ Solution is (3, 1).
Thus, the four solutions are (0, 7), (1, 5), (2, 3) and (3, 1).

(ii) $\pi x + y = 9$
When $x = 0$, $\pi(0) + y = 9 \Rightarrow y = 9$
$\therefore$ Solution is (0, 9).
When $x = 1$, $\pi(1) + y = 9 \Rightarrow y = 9 - \pi$
$\therefore$ Solution is $(1, (9 - \pi))$.
When $x = 2$, $\pi(2) + y = 9 \Rightarrow y = 9 - 2\pi$
$\therefore$ Solution is $(2, (9 - 2\pi))$.
When $x = -1$, $\pi(-1) + y = 9 \Rightarrow -\pi + y = 9 \Rightarrow y = 9 + \pi$
$\therefore$ Solution is $(-1, (9 + \pi))$.
Thus, the four solutions are (0, 9), $(1, (9 - \pi))$, $(2, (9 - 2\pi))$ and $(-1, (9 + \pi))$.

(iii) $x = 4y$
When $x = 0$, $4y = 0 \Rightarrow y = 0$
$\therefore$ Solution is (0, 0).

When $x = 1$, $4y = 1 \Rightarrow y = \frac{1}{4}$

$\therefore$ Solution is $\left(1, \frac{1}{4}\right)$.

When $x = 4$, $4 = 4y \Rightarrow y = \frac{4}{4} = 1 \Rightarrow y = 1$
$\therefore$ Solution is (4, 1).
When $x = -4$, $4y = -4$

$\Rightarrow y = \frac{-4}{4} = -1 \Rightarrow y = -1$

$\therefore$ Solution is (–4, –1).

Thus, the four solutions are (0, 0), (1, 1/4), (4, 1) and (–4, –1).

3. (i) (0, 2) means $x = 0$ and $y = 2$

Putting $x = 0$ and $y = 2$ in $x - 2y = 4$, we get

L.H.S. = 0 – 2(2) = – 4. But R.H.S. = 4

$\Rightarrow$ L.H.S. ≠ R.H.S.

$\therefore$ $x = 0, y = 2$ is not a solution.

(ii) (2, 0) means $x = 2$ and $y = 0$

Putting $x = 2$ and $y = 0$ in $x - 2y = 4$, we get

L.H.S. = 2 – 2(0) = 2 – 0 = 2. But R.H.S. = 4

$\Rightarrow$ L.H.S. ≠ R.H.S.

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

(iii) (4, 0) means $x = 4$ and $y = 0$

Putting $x = 4$ and $y = 0$ in $x - 2y = 4$, we get

L.H.S. = 4 – 2(0) = 4 – 0 = 4 = R.H.S.

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

(iv) $(\sqrt{2}, 4\sqrt{2})$ means $x = \sqrt{2}$ and $y = 4\sqrt{2}$

Putting $x = \sqrt{2}$ and $y = 4\sqrt{2}$ in $x - 2y = 4$, we get

L.H.S. = $\sqrt{2} - 2(4\sqrt{2}) = \sqrt{2} - 8\sqrt{2} = \sqrt{2}(1-8) = -7\sqrt{2}$

But R.H.S. = 4

$\Rightarrow$ L.H.S. ≠ R.H.S. $\therefore$ $(\sqrt{2}, 4\sqrt{2})$ is not a solution.

(v) (1, 1) means $x = 1$ and $y = 1$

Putting $x = 1$ and $y = 1$ in $x - 2y = 4$, we get

L.H.S. = 1 – 2(1) = 1 – 2 = –1. But R.H.S. = 4

$\Rightarrow$ L.H.S. ≠ R.H.S. $\therefore$ (1, 1) is not a solution.

4. We have $2x + 3y = k$

Putting $x = 2$ and $y = 1$ in $2x + 3y = k$, we get

$2(2) + 3(1) = k \Rightarrow 4 + 3 = k \Rightarrow 7 = k$

Thus, the required value of k is 7.

BEST SELLING BOOKS FOR CLASS 9

Visit www.mtg.in for complete information