EXERCISE – 4A

Answer.1.

(i) $3x + 5y = 7.5$

We have,

$\Rightarrow 3x + 5y - 7.5 = 0$

$\Rightarrow 6x + 10y - 15 = 0$

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

$a = 6, b = 10$ and $c = -15$

(ii) $2x - \frac{y}{5} + 6 = 0$

We have,

$2x - \frac{y}{5} + 6 = 0$

$\Rightarrow 10x - y + 30 = 0$

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

$a = 10, b = -1$ and $c = 30$

(iii) $3y - 2x = 6$

We have,

$3y - 2x = 6$

$\Rightarrow -2x + 3y - 6 = 0$

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

$a = -2, b = 3$ and $c = -6$

(iv) $4x = 5y$

We have,

$4x = 5y$

$\Rightarrow 4x - 5y = 0$

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

$a = 4, b = -5$ and $c = 0$

(v) $\frac{x}{5} - \frac{y}{6} = 1$

We have,

$\frac{x}{5} - \frac{y}{6} = 1$

$\Rightarrow (6x - 5y)/30 = 1$

$\Rightarrow 6x - 5y = 30$

$\Rightarrow 6x - 5y - 30 = 0$

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

$a = 6, b = -5$ and $c = -30$

(vi) $\sqrt{2}x + \sqrt{3}y = 5$

We have,

$\sqrt{2}x + \sqrt{3}y = 5$

$\Rightarrow \sqrt{2}x + \sqrt{3}y - 5 = 0$

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

$a = \sqrt{2}, b = \sqrt{3}$ and $c = -5$

Answer.2.

(i) $x = 6$

We have,

$x = 6$

$\Rightarrow x - 6 = 0$

$\Rightarrow x - 0y - 6 = 0$

Comparing this equation with $ax + by + c = 0$, we get
$a = 1, b = 0 \text{ and } c = -6$

(ii) $3x - y = x - 1$

We have,
$3x - y = x - 1$
$\Rightarrow 3x - x - y + 1 = 0$
$\Rightarrow 2x - y + 1 = 0$

Comparing this equation with $ax + by + c = 0$, we get
$a = 2, b = -1 \text{ and } c = 1$

(iii) $2x + 9 = 0$

We have,
$2x + 9 = 0$
$\Rightarrow 2x + 0y + 9 = 0$

Comparing this equation with $ax + by + c = 0$, we get
$a = 2, b = 0 \text{ and } c = 9$

(iv) $4y = 7$

We have,
$4y = 7$
$\Rightarrow 0x + 4y - 7 = 0$
Comparing this equation with $ax + by + c = 0$, we get
$a = 0, b = 4 \text{ and } c = -7$

(v) $x + y = 4$

We have,
$x + y = 4$
$\Rightarrow x + y - 4 = 0$
Comparing this equation with $ax + by + c = 0$, we get
$a = 1, b = 1 \text{ and } c = -4$

(vi) $\frac{x}{2} - \frac{y}{3} = \frac{1}{6} + y$

We have,

$\frac{x}{2} - \frac{y}{3} = \frac{1}{6} + y$
$\Rightarrow \frac{x}{2} - \frac{y}{3} - y = \frac{1}{6}$
$\Rightarrow \frac{3x - 2y - 6y}{6} = \frac{1}{6}$
$\Rightarrow 3x - 8y = 1$
$\Rightarrow 3x - 8y - 1 = 0$
Comparing this equation with $ax + by + c = 0$, we get
$a = 3, b = -8 \text{ and } c = -1$

Answer.3.

(i) (4,0)

Equation is 5x - 4y = 20
Substituting x = 4 and y = 0 in L.H.S. of equation,
L.H.S. = 5x - 4y
= 5(4) - 4(0)
= 20 - 0
= 20

= R.H.S.

Hence, (4, 0) is the solution of the equation

(ii) (0,5)

Equation is 5x - 4y = 20

Substituting x = 0 and y = 5 in L.H.S. of equation,

L.H.S. = 5x - 4y

= 5(0) - 4(5)

= 0 - 20

= -20

$\neq$ R.H.S.

Hence, (0, 5) is **NOT** the solution of the equation.

(iii) $\left(-2, \frac{5}{2}\right)$

Equation is 5x - 4y = 20

Substituting x = -2 and y = $\left(\frac{5}{2}\right)$ in L.H.S. of equation,

L.H.S. = 5x - 4y

= 5(-2) $-$ 4$\left(\frac{5}{2}\right)$

= -10 - 10

= -20

$\neq$ R.H.S.

Hence, $\left(-2, \frac{5}{2}\right)$ is **NOT** the solution of the equation.

(iv) (0, -5)

Equation is 5x - 4y = 20

Substituting x = 0 and y = -5 in L.H.S. of equation,

L.H.S. = 5x - 4y

= 5(0) - 4(-5)

= 0 + 20

= 20

= R.H.S.

Hence, (0, -5) is the solution of the equation.

(v) $\left(2, \frac{-5}{2}\right)$

Equation is 5x - 4y = 20

Substituting x = 2 and y = $\left(\frac{-5}{2}\right)$ in L.H.S. of equation,

L.H.S. = 5x - 4y

= 5(2) - 4$\left(\frac{-5}{2}\right)$

= 10 + 10

= 20

= R.H.S.

Hence, $\left(2, \frac{-5}{2}\right)$ is the solution of the equation.

Answer.4.

(i) Equation is $2x - 3y = 6$

Substituting $x = 0$ in the equation,

$2(0) - 3y = 6$

$\Rightarrow 0 - 3y = 6$

$\Rightarrow 3y = -6$

$\Rightarrow y = -2$

So, $(0, -2)$ is the solution of the equation.

Substituting $y = 0$ in the equation,

$2x - 3(0) = 6$

$\Rightarrow 2x - 0 = 6$

$\Rightarrow 2x = 6$

$\Rightarrow x = 3$

So, $(\mathbf{3}, \mathbf{0})$ is the solution of the equation.

Substituting $x = 6$ in the equation,

$2(6) - 3y = 6$

$\Rightarrow 12 - 3y = 6$

$\Rightarrow 3y = 6$

$\Rightarrow y = 2$

So, $(\mathbf{6}, \mathbf{2})$ is the solution of the equation.

Substituting $y = 4$ in the equation,

$2x - 3(4) = 6$

$\Rightarrow 2x - 12 = 6$

$\Rightarrow 2x = 18$

$\Rightarrow x = 9$

So, $(\mathbf{9}, \mathbf{4})$ is the solution of the equation.

Substituting $x = -3$ in the equation,

$2(-3) - 3y = 6$

$\Rightarrow -6 - 3y = 6$

$\Rightarrow 3y = -12$

$\Rightarrow y = -4$

So, $(-\mathbf{3}, -\mathbf{4})$ is the solution of the equation.

(ii) Equation is $\frac{2x}{5} + \frac{3y}{10} = \mathbf{3}$

$\Rightarrow \frac{4x+3y}{10} = 3$

$\Rightarrow \mathbf{4x + 3y = 30}$ **...(i)**

Substituting $x = 0$ in (i),

$4(0) + 3y = 30$

$\Rightarrow 3y = 30$

$\Rightarrow y = 10$

So, $(\mathbf{0}, \mathbf{10})$ is the solution of the equation.

Substituting $x = 3$ in (i),

$4(3) + 3y = 30$

$\Rightarrow 12 + 3y = 30$

$\Rightarrow 3y = 18$

$\Rightarrow y = 6$

So, $(\mathbf{3}, \mathbf{6})$ is the solution of the equation.

Substituting $x = -3$ in (i),

$4(-3) + 3y = 30$

$\Rightarrow -12 + 3y = 30$

$\Rightarrow 3y = 42$

$\Rightarrow y = 14$

So, $(-\mathbf{3}, \mathbf{14})$ is the solution of the equation.

Substituting $y = 2$ in (i),

$4x + 3(2) = 30$

$\Rightarrow 4x + 6 = 30$

$\Rightarrow 4x = 24$

$\Rightarrow x = 6$

So, $(\mathbf{6}, \mathbf{2})$ is the solution of the equation.

Substituting $y = -2$ in (i),

$4x + 3(-2) = 30$

$\Rightarrow 4x - 6 = 30$

$\Rightarrow 4x = 36$

$\Rightarrow x = 9$

So, $(\mathbf{9}, -\mathbf{2})$ is the solution of the equation.

(iii) Equation is $3y = 4x$

Substituting $x = 3$ in the equation,

$3y = 4(3)$

$\Rightarrow 3y = 12$

$\Rightarrow y = 4$

So, $(3, 4)$ is the solution of the equation.

Substituting $x = -3$ in the equation,

$3y = 4(-3)$

$\Rightarrow 3y = -12$

$\Rightarrow y = -4$

So, $(-3, -4)$ is the solution of the equation.

Substituting $x = 9$ in the equation,

$3y = 4(9)$

$\Rightarrow 3y = 36$

$\Rightarrow y = 12$

So, $(9, 12)$ is the solution of the equation.

Substituting $y = 8$ in the equation,

$3(8) = 4x$

$\Rightarrow 4x = 24$

$\Rightarrow x = 6$

So, $(6, 8)$ is the solution of the equation.

Substituting $y = -8$ in the equation,

$3(-8) = 4x$

$\Rightarrow 4x = -24$

$\Rightarrow x = -6$

So, $(-6, -8)$ is the solution of the equation.

Answer.5. Given x = 3 and y = 4 is a solution of the equation 5x - 3y = k,

Substituting x = 3 and y = 4 in equation 5x - 3y = k, we get

5(3) - 3(4) = k

$\Rightarrow$ 15 - 12 = k

$\Rightarrow$ k = 3

Answer.6. Given x = 3k + 2 and y = 2k - 1 is a solution of the equation 4x - 3y + 1 = 0,

Substituting these values in equation, we get

4(3k + 2) - 3(2k - 1) + 1 = 0

$\Rightarrow$ 12k + 8 - 6k + 3 + 1 = 0

$\Rightarrow$ 6k + 12 = 0

$\Rightarrow$ 6k = -12

$\Rightarrow$ k = -2

Answer.7. Let the cost of a pencil and cost of ballpoint to be ₹ x and ₹ y respectively.

So,

Cost of 5 pencils = ₹ $5x$

Cost of 2 ballpoints = ₹ $2y$

According to question,

$5x = 2y$

$\Rightarrow 5x - 2y = 0$

$\therefore$ Required Equation, $5x - 2y = 0$