

5. Linear equations in two variables

Q. 1) $\frac{x}{3} + \frac{y}{4} = 4$, $\frac{5x}{6} - \frac{y}{8} = 4$

Ans : $\frac{x}{3} + \frac{y}{4} = 4$ (I)

$$\frac{5x}{6} - \frac{y}{8} = 4 \quad \text{..... (II)}$$

Multiplying each term of equation (I) by 12,

$$12 \times \frac{x}{3} + 12 \times \frac{y}{4} = 4 \times 12$$

$$4x + 3y = 48 \quad \text{..... (III)}$$

Multiplying each term of equation (II) by 48,

$$48 \times \frac{5x}{6} - 48 \times \frac{y}{8} = 48 \times 4$$

$$40x - 6y = 192 \quad \text{..... (IV)}$$

Adding equation (III) $\times 2$ and equation (IV),

$$4x \times 2 + 3 \times 2y = 48 \times 2$$

$$8x + 6y = 96 \quad \text{..... (V)}$$

$$\therefore 8x + 6y = 96 \quad \text{..... (V)}$$

$$+40x - 6y = 192 \quad \text{..... (IV)}$$

$$48x + 0 = 288$$

$$48x = 288$$

$$x = \frac{288}{48}$$

$$\boxed{x = 6}$$

Substituting $x = 6$ in equation (III)

$$4x + 3y = 48$$

$$4(6) + 3y = 48$$

$$3y = 48 - 24$$

$$3y = 24$$

$$y = \frac{24}{3}$$

$$\boxed{y = 8}$$

$\therefore (6, 8)$ is the solution of given equation.

Q. 2) Write three solutions of the equation $x + y = 10$ (2 mark)

Ans : $x + y = 10$

i) $x = -1$

$$\therefore -1 + y = 10$$

$$\therefore y = 10 + 1$$

$$\therefore y = 11$$

$$\therefore (-1, 11)$$

$$\text{ii) } x = 3$$

$$\therefore 3 + y = 10$$

$$\therefore y = 10 - 3$$

$$\therefore y = 7$$

$$\therefore (3, 7)$$

$$\text{iii) } x = -2$$

$$\therefore -2 + y = 10$$

$$\therefore y = 10 + 2$$

$$\therefore y = 12$$

$$\therefore (-2, 12)$$

$$\text{Q. 3) } x + y = 8, x - y = 2$$

$$\text{Ans : } x + y = 8 \dots\dots\dots \text{(I)}$$

$$x - y = 2 \dots\dots\dots \text{(II)}$$

The coefficients of 'y' variable are the same, but signs are different.

∴ Adding equations (I) and (II) ,

$$\begin{array}{r} x + y = 8 \\ x - y = 2 \\ \hline 2x + 0 = 10 \end{array}$$

$$\therefore 2x = 10$$

$$\therefore x = \frac{10}{2}$$

$$\therefore \boxed{x = 5}$$

Substituting $x = 5$ in equations (I), We get

$$x + y = 8$$

$$\therefore 5 + y = 8$$

$$\therefore y = 8 - 5$$

$$\therefore \boxed{y = 3}$$

∴ (5, 3) is the solution of given equations.

Q. 4) Four times of a larger number is equal to five times of smaller number.

Ans : Let larger number be x and small number be y

$$\therefore 4x = 5y$$

Q. 5) Reena is 4 years older than Tina.

Ans : Let Reena be x and Tina be y .

$$\therefore x = y + 4$$