4.3 SOLUTION OF LINEAR EQUATIONS

SOLUTION OF LINEAR EQUATION ONE VARIABLE

Let $ax + b = 0$ is one equation then $ax + b = 0 \Rightarrow ax + - b \Rightarrow x = - \frac{b}{a}$ is a solution.

Ex.7 Solve : $\frac{x}{2} = 3 + \frac{x}{3}$

Sol. Given $\frac{x}{2} = 3 + \frac{x}{3} \Rightarrow \frac{x}{2} - \frac{x}{3} = 3$

$\Rightarrow \quad \frac{3x - 2x}{6} = 3$

$\Rightarrow \quad \frac{x}{6} = 3$

$\Rightarrow \quad x = 18$ **Ans.**

SOLUTION OF LINEAR EQUATIONS IN TWO VARIABLE

(a) By Elimination of Making Equal Coefficient :

Ex.8 Solve the following equations

$2x - 3y = 5$

$3x + 2y = 1$

Sol. Given eq. are $2x - 3y = 5$ .....(i)

$3x + 2y = 1$ ....(ii)

Multiplying 1 eg.(i) by 3 and eg. (ii) by 2 we get

$6x - 9y = 15$

On subtraction $\underline{-6x + -4y = -2}$

$-9y - 4y = 15 - 2$

$\Rightarrow \quad -13y = 13$

$\Rightarrow \quad y = \frac{13}{-13}$

$\Rightarrow \quad y = -1$

Put the value of y in eg. (i) we get

$2x - (3) \times (-1) = 5$

$2x + 3 = 5$

$\Rightarrow \quad 2x = 5 - 3$

$\Rightarrow \quad 2x = 2$

$\Rightarrow \quad x = 1$

$\therefore \quad x = 1, y = 1$ **Ans.**

(b) Substitution Method :

Ex.9 Solve $x + 4y = 14$ ....(i)

$7x - 3y =$ ...(ii)

Sol. From equation (i) $x = 14 - 4y$

Substitute the value of x in equation (ii)

$\Rightarrow$ $7(14 - 4y) - 3y = 5$

$\Rightarrow$ $98 - 28y - 3y = 5$

$\Rightarrow$ $98 - 31y = 5$

$\Rightarrow$ $93 = 31y$

$\Rightarrow$ $y = \frac{93}{31}$

$\Rightarrow$ $y = 3$

Now substitute value of y in equation (ii)

$\Rightarrow$ $7x - 3(3) = 5$

$\Rightarrow$ $7x - 3(3) = 5$

$\Rightarrow$ $7x = 14$

$\Rightarrow$ $x = \frac{14}{7} = 2$

So, solution is $x = 2$ and $y = 3$. **Ans.**