CLASS 8

LINEAR EQUATION IN ONE VARIABLE

CROSS-MULTIPLICATION METHOD FOR SOLVING EQUATION OF THE FORM

Cross-Multiplication Method for Solving Equations of the form :

 $\frac{ax+b}{cx+d} = \frac{m}{n}$ \Rightarrow n(ax + b) = m (cx + d) Solve : $\frac{2x+1}{3x-2} = \frac{9}{10}$ Q.1 We have, $\frac{2x+1}{3x-2} = \frac{9}{10}$ Sol. $\Rightarrow 10 \times (2x+1) = 9 \times (3x-2)$ [By cross-multiplication] $\Rightarrow 20x + 10 = 27x - 18$ $\Rightarrow 20x - 27x = -18 - 10$ [Using transposition] \Rightarrow -7x = -28 $\Rightarrow \frac{-7x}{-7} = \frac{-28}{-7}$ [Dividing both sides by -7] $\Rightarrow x = 4$

Hence, x = 4 is the solution of the given equation.

Q.2 Solve :
$$\frac{3x+5}{2x+7} = 4$$

Sol. We have, $=\frac{3x+5}{2x+7}=4$

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$$\Rightarrow \frac{3x+5}{2x+7} = \frac{1}{4}$$

 $\Rightarrow 1 \times (3x+5) = 4 \times (2x+7)$

[By cross-multiplication]

$$\Rightarrow 3x + 5 = 8x + 28$$

$$\Rightarrow 3x - 8x = 28 - 5$$
 [Using transposition]

$$\Rightarrow -5x = 23$$

$$\Rightarrow \frac{-5x}{-5} = \frac{23}{-5} \Rightarrow x = -\frac{23}{5}$$

Hence, $x = -\frac{23}{5}$ is the solution of the given equation.
Q.3 Solve : $\frac{17(2-x)-5(x+12)}{1-7x} = 8$
Sol. We have, $\frac{17(2-x)-5(x+12)}{1-7x} = 8$

$$\Rightarrow \frac{34-17x-5x+60}{1-7x} = \frac{8}{1}$$

$$\Rightarrow \frac{-22x-26}{1-7x} = \frac{8}{1}$$

$$\Rightarrow 1 \times (-22x - 26) = 8 \times (1 - 7x)$$

[By cross-multiplication]

$$\Rightarrow -22x - 26 = 8 - 56x$$

$$\Rightarrow -22x + 56x = 8 + 26$$

$$\Rightarrow 34x = 34 \Rightarrow \frac{34x}{34} = \frac{34}{34}$$

Hence, x = 1 is the solution of the given equation.