



SpeedLabs

MATHS

CBSE 8th

TEEVRA EDUTECH PVT. LTD.

Linear Equation

Exercise-2.3

Q.1 Solve the following equations and check your results, $3x = 2x + 18$.

Sol: The given linear equation is

$$\Rightarrow 3x = 2x + 18$$

$$\Rightarrow 3x - 2x = 18 \quad x = 18 \text{ (Transposing } 2x \text{ to L.H.S.)}$$

\Rightarrow Th check:

On putting $x = 18$ in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = 3x = 3 \times 18 = 54$$

$$\text{R.H.S.} = 2x + 18 = 2 \times 18 + 18 = 36 + 18 = 54$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, $x = 18$ is the required solution.

Q.2 Solve the following equations and check your results, $5t - 3 = 3t - 5$.

Sol: The given linear equation is $5t - 3 = 3t - 5$

$$\Rightarrow 5t - 3t = -5 + 3 \text{ (Transposing } 3t \text{ to L.H.S. and } 3 \text{ to R.H.S.)}$$

$$\Rightarrow 2t = -2$$

$$\Rightarrow \frac{2t}{2} = \frac{-2}{2} \text{ (Dividing both sides by } 2)$$

$$\Rightarrow t = -1$$

To check:

On putting $t = -1$, in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = 5t - 3 = 5 \times (-1) - 3 = -5 - 3 = -8$$

$$\text{R.H.S.} = 3t - 5 = 3 \times (-1) - 5 = -3 - 5 = -8$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, $t = -1$ is the required solution.

Q.3 Solve the following equations and check your results, $5x + 9 = 5 + 3x$.

Sol: The given linear equation is $5x+9 = 5+3x$

$$\Rightarrow 5x-3x = 5-9 \text{ (Transposing } 3x \text{ to L.H.S. and } 9 \text{ to R.H.S.)}$$

$$\Rightarrow 2x = -4$$

$$\Rightarrow \frac{2x}{2} = \frac{-4}{2} \text{ (Dividing both sides by 2)}$$

$$\Rightarrow \text{or } x = -2$$

To check:

On putting $x = -2$ in L.H.s. and R.H.S. of the given equation,

$$\text{L.H.S.} = 5x + 9 = 5 \times (-2) + 9 = -10 + 9 = -1$$

$$\text{R.H.S.} = 5 + 3x = 5 + 3 \times (-2) = 5 - 6 = -1$$

\Rightarrow L.H.S. = R.H.S. Hence, $x = -2$ is the required solution.

Q.4 Solve the following equations and check your results, $4z + 3 = 6 + 2z$.

Sol: The given linear equation is $4z + 3 = 6 + 2z$

$$\Rightarrow 4z - 2z = 6 - 3 \text{ (Transposing } 2z \text{ to L.H.S. and } 3 \text{ to R.H.S.)}$$

$$\Rightarrow 2z = 3 \quad \text{(Dividing both sides by 2)}$$

$$\Rightarrow \frac{2z}{2} = \frac{3}{2} \text{ (Dividing both side by 2)}$$

$$\text{or } z = \frac{3}{2}$$

To check:

On putting $z = \frac{3}{2}$ in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = 4z + 3 = 4 \times \frac{3}{2} + 3 = 2 \times 3 + 3 = 6 + 3 = 9$$

$$\text{R.H.S.} = 6 + 2z = 6 + 2 \times \frac{3}{2} = 6 + 3 = 9$$

\Rightarrow L.H.S. = R.H.S

Hence, $z = \frac{3}{2}$ is the required solution.

Q.5 Solve the following equations and check your results, $2x - 1 = 14 - x$.

Sol: The given linear equation is $2x - 1 = 14 - x$

$$\Rightarrow 2x + x = 14 + 1 \quad (\text{Transposing } x \text{ to L.H.S. and } 1 \text{ to R.H.S.})$$

$$\Rightarrow 3x = 15$$

$$\Rightarrow \frac{3x}{3} = \frac{15}{3} \quad (\text{Dividing both sides by } 3)$$

$$\text{or } x = 5$$

To check:

On putting $x = 5$, in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = 2x - 1 = 2 \times 5 - 1 = 10 - 1 = 9$$

$$\text{R.H.S.} = 14 - x = 14 - 5 = 9$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, $x = 5$, is the required solution.

Q.6 Solve the following equations and check your results, $8x + 4 = 3(x - 1) + 7$

Sol: The given linear equation is $8x + 4 = 3(x - 1) + 7$

$$\Rightarrow 8x + 4 = 3x - 3 + 7$$

$$\Rightarrow 8x - 3x = -3 + 7 - 4 \quad (\text{Transposing } 3x \text{ to L.H.S. and } 4 \text{ to R.H.S.})$$

$$\Rightarrow 5x = 4 - 4 \Rightarrow 5x = 0$$

$$\text{or } x = \frac{0}{5} = 0 \quad (\text{Dividing both sides by } 5)$$

To check:

On putting $x = 0$ in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = 8x + 4 = 8 \times 0 + 4 = 0 + 4 = 4$$

$$\text{R.H.S.} = 3(x - 1) + 7 = 3(0 - 1) + 7 = -3 + 7 = 4$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, $x = 0$ is the required solution.

Q.7 Solve the following equations and check your results, $x = \frac{4}{5}(x + 10)$.

Sol: The given linear equation is

$$x = \frac{4}{5}(x + 10)$$

$$\Rightarrow 5x = 5 \times \frac{4}{5}(x + 10) \quad (\text{Multiplying both side by 5})$$

$$\Rightarrow 5x = 4(x + 10)$$

$$\Rightarrow 5x = 4x + 40$$

$$\Rightarrow 5x - 4x = 40 \quad x = 40 \quad (\text{Transposing } 4x \text{ to L.H.S.})$$

$$\text{or } x = 40$$

To check:

On putting $x = 40$ in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = x = 40$$

$$\text{R.H.S.} = \frac{4}{5}(x + 10) = \frac{4}{5}(40 + 10) = \frac{4}{5} \times 50 = 40$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, $x = 40$ is the required solution.

Q.8 Solve the following equations and check your results, $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$.

Sol: The given linear equation is $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$

$$\Rightarrow \frac{2x}{3} = \frac{7x}{15} = 3 - 1 \quad (\text{Transposing } \frac{7x}{15} \text{ to L. H. S. and } 1 \text{ to R. H. S.})$$

$$\Rightarrow \frac{10x - 7x}{15} = 2$$

$$\Rightarrow 3x = 30 \quad (\text{Multiplying both sides by 15})$$

$$\Rightarrow x = \frac{30}{3} \quad (\text{Dividing both sides by 3})$$

$$\text{or } x = 10$$

To check:

On putting $x = 10$ in L.H.S. and R.H.S. of the given equation,

$$\text{L.H.S.} = \frac{2x}{3} + 1 = \frac{2 \times 10}{3} + 1 = \frac{20}{3} + 1 = \frac{20+3}{3} = \frac{23}{3}$$

$$\text{R. H. S.} = \frac{7x}{15} + 3 = \frac{7 \times 10}{15} + 3 = \frac{7 \times 2}{3} + 3 = \frac{14}{3} + 3 = \frac{14+9}{3} = \frac{23}{3}$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, $x = 10$ is the required solution.

Q.9 Solve the following equations and check your results, $2y + \frac{5}{3} = \frac{26}{3} - y$.

Sol: The given linear equation is $2y + \frac{5}{3} = \frac{26}{3} - y$

$$\Rightarrow 2y + y = \frac{26}{3} - \frac{5}{3} \quad \left(\text{Transposing } y \text{ to L. H. S. and } \frac{5}{3} \text{ to R. H. S.} \right)$$

$$\Rightarrow 3y = \frac{26-5}{3} \Rightarrow 3y = \frac{21}{3}$$

$$\Rightarrow \frac{3y}{3} = \frac{21}{3 \times 3} \quad (\text{Dividing both sides by 3})$$

$$\text{or } y = \frac{7}{3}$$

To check:

On putting $y = \frac{7}{3}$ in L. H. S. and R. H. S. of the given equation,

$$\text{L. H. S.} = 2y + \frac{5}{3} = 2 \times \frac{7}{3} + \frac{5}{3} = \frac{14}{3} + \frac{5}{3} = \frac{14+5}{3} = \frac{19}{3}$$

$$\text{R. H. S.} = \frac{26}{3} - y = \frac{26}{3} - \frac{7}{3} = \frac{26-7}{3} = \frac{19}{3}$$

$$\Rightarrow \text{L. H. S.} = \text{R. H. S.}$$

Hence, $y = \frac{7}{3}$ is the required solution.

Q.10 Solve the following equations and check your results, $3m = 5m - \frac{8}{5}$.

Sol: The given linear equation is

$$3m = 5m - \frac{8}{5}$$

$$\Rightarrow 3m - 5m = -\frac{8}{5} \quad (\text{Transposing } 5m \text{ to L. H. S.})$$

$$\Rightarrow -2m = \frac{-8}{5} \Rightarrow \frac{-2m}{2} = \frac{-8}{5 \times 2} \quad (\text{Dividing both sides by 2})$$

$$\Rightarrow -m = \frac{-4}{5} \text{ or } m = \frac{4}{5}$$

To check:

On putting $m = \frac{4}{5}$ in L. H. S. and R. H. S. of given equation,

$$\text{L. H. S.} = 3m = 3 \times \frac{4}{5} = \frac{12}{5}$$

$$\text{R. H. S.} = 5m - \frac{8}{5} = 5 \times \frac{4}{5} - \frac{8}{5} = \frac{4}{1} - \frac{8}{5} = \frac{20-8}{5} = \frac{12}{5}$$

$$\Rightarrow \text{L. H. S.} = \text{R. H. S.}$$

Hence, $m = \frac{4}{5}$ is the required solution.