

Mathematics

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(Chapter - 2) (Linear Equations in One Variable)

(Class - VIII)

Exercise 2.3

Question 1:

Solve the following equations and check your results: $3x = 2x + 18$

Answer 1:

$$3x = 2x + 18$$

$$\Rightarrow 3x - 2x = 18 \quad \Rightarrow x = 18$$

To check: $3x = 2x + 18$

$$\Rightarrow 3 \times 18 = 2 \times 18 + 18 \quad \Rightarrow 54 = 36 + 18$$

$$\Rightarrow 54 = 54 \quad \Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, it is correct.

Question 2:

Solve the following equations and check your results: $5t - 3 = 3t - 5$

Answer 2:

$$5t - 3 = 3t - 5$$

$$\Rightarrow 5t - 3t = -5 + 3 \quad \Rightarrow 2t = -2 \quad \Rightarrow t = \frac{-2}{2} = -1$$

To check: $5t - 3 = 3t - 5$

$$\Rightarrow 5 \times (-1) - 3 = 3 \times (-1) - 5 \quad \Rightarrow -5 - 3 = -3 - 5 \quad \Rightarrow -8 = -8$$

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

Hence, it is correct.

Question 3:

Solve the following equations and check your results: $5x + 9 = 5 + 3x$

Answer 3:

$$5x + 9 = 5 + 3x$$

$$\Rightarrow 5x - 3x = 5 - 9 \quad \Rightarrow 2x = -4 \quad \Rightarrow x = \frac{-4}{2} = -2$$

To check: $5x + 9 = 5 + 3x$

$$\Rightarrow 5 \times (-2) + 9 = 5 + 3 \times (-2) \quad \Rightarrow -10 + 9 = 5 - 6 \quad \Rightarrow -1 = -1$$

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

Hence, it is correct.

Question 4:

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

Answer 4:

$$4z + 3 = 6 + 2z$$

$$\Rightarrow 4z - 2z = 6 - 3 \quad \Rightarrow 2z = 3 \quad \Rightarrow z = \frac{3}{2}$$

To check: $4z + 3 = 6 + 2z$

$$\Rightarrow 4 \times \frac{3}{2} + 3 = 6 + 2 \times \frac{3}{2} \quad \Rightarrow 2 \times 3 + 3 = 6 + 3 \quad \Rightarrow 6 + 3 = 9$$

$$\Rightarrow 9 = 9 \quad \Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, it is correct.

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Question 5:

Solve the following equations and check your results: $2x - 1 = 14 - x$

Answer 5:

$$2x - 1 = 14 - x$$

$$\Rightarrow 2x + x = 14 + 1 \quad \Rightarrow 3x = 15 \quad \Rightarrow x = \frac{15}{3} = 5$$

To check: $2x - 1 = 14 - x$

$$\Rightarrow 2 \times 5 - 1 = 14 - 5 \quad \Rightarrow 10 - 1 = 9 \quad \Rightarrow 9 = 9$$

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

Hence, it is correct.

Question 6:

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

Answer 6:

$$8x + 4 = 3(x - 1) + 7$$

$$\Rightarrow 8x + 4 = 3x - 3 + 7 \quad \Rightarrow 8x - 3x = -3 + 7 - 4 \quad \Rightarrow 5x = 0$$

$$\Rightarrow x = \frac{0}{5} = 0$$

To check:

$$8x + 4 = 3(x - 1) + 7$$

$$\Rightarrow 8 \times 0 + 4 = 3(0 - 1) + 7 \quad \Rightarrow 0 + 4 = 3 \times (-1) + 7 \quad \Rightarrow 4 = -3 + 7$$

$$\Rightarrow 4 = 4 \quad \Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, it is correct.

Question 7:

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

Answer 7:

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

$$\Rightarrow 5x = 4(x + 10) \quad \Rightarrow 5x = 4x + 40 \quad \Rightarrow 5x - 4x = 40$$

$$\Rightarrow x = 40$$

To check:

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

$$\Rightarrow 40 = \frac{4}{5}(40 + 10) \quad \Rightarrow 40 = \frac{4}{5} \times 50 \quad \Rightarrow 40 = 4 \times 10$$

$$\Rightarrow 40 = 40 \quad \Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence, it is correct.

Question 8:

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

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Answer 8:

$$\frac{2x}{3} + 1 = \frac{7x}{15} + 3$$

$$\Rightarrow \frac{2x}{3} - \frac{7x}{15} = 3 - 1 \quad \Rightarrow \frac{10x - 7x}{15} = 2 \quad \Rightarrow 3x = 30 \quad \Rightarrow x = \frac{30}{3} = 10$$

To check: $\frac{2x}{3} + 1 = \frac{7x}{15} + 3$

$$\Rightarrow \frac{2 \times 10}{3} + 1 = \frac{7 \times 10}{15} + 3 \Rightarrow \frac{20}{3} + 1 = \frac{14}{3} + 3 \Rightarrow \frac{20 + 3}{3} = \frac{14 + 9}{3} \Rightarrow \frac{23}{3} = \frac{23}{3}$$

\Rightarrow L.H.S. = R.H.S. Hence, it is correct.

Question 9:

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

Answer 9:

$$2y + \frac{5}{3} = \frac{26}{3} - y$$

$$\Rightarrow 2y + y = \frac{26}{3} - \frac{5}{3} \quad \Rightarrow 3y = \frac{26 - 5}{3} \quad \Rightarrow 3y = \frac{21}{3}$$

$$\Rightarrow y = \frac{21}{3 \times 3} = \frac{7}{3}$$

To check: $2y + \frac{5}{3} = \frac{26}{3} - y$

$$\Rightarrow 2 \times \frac{7}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3} \quad \Rightarrow \frac{14}{3} + \frac{5}{3} = \frac{26}{3} - \frac{7}{3} \quad \Rightarrow \frac{14 + 5}{3} = \frac{26 - 7}{3}$$

$$\Rightarrow \frac{19}{3} = \frac{19}{3}$$

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

Hence, it is correct.

Question 10:

Solve the following equations and check your results: $3m = 5m - \frac{8}{5}$

Answer 10:

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

$$\Rightarrow 3m - 5m = -\frac{8}{5} \quad \Rightarrow -2m = -\frac{8}{5} \quad \Rightarrow m = \frac{-8}{5 \times (-2)} \quad \Rightarrow m = \frac{4}{5}$$

To check: $3m = 5m - \frac{8}{5}$

$$\Rightarrow 3 \times \frac{4}{5} = 5 \times \frac{4}{5} - \frac{8}{5} \quad \Rightarrow \frac{12}{5} = 4 - \frac{8}{5} \quad \Rightarrow \frac{12}{5} = \frac{20 - 8}{5} \quad \Rightarrow \frac{12}{5} = \frac{12}{5}$$

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

Hence, it is correct.