



Exercise 7A

$$\begin{aligned} &= \frac{\frac{13}{2} + 7}{3} \\ &= \frac{1 \times 13 + 2 \times 7}{2 \times 3} \\ &= \frac{13 + 14}{6} \\ &= \frac{27}{6} \\ &= \frac{9}{2} \end{aligned}$$

$$\begin{aligned} \text{RHS} &= 1 + \frac{3 \times \frac{13}{2} - 2}{5} \\ &= 1 + \frac{\frac{39 - 2 \times 2}{2}}{5} \\ &= 1 + \frac{35}{10} \\ &= \frac{45}{10} \\ &= \frac{9}{2} \end{aligned}$$

$$\therefore \text{LHS} = \text{RHS}$$

Hence, $y = \frac{13}{2}$ is a solution of the given equation.

Q22

Answer :

We have:

$$\Rightarrow \frac{2}{7} (x - 9) + \frac{x}{3} = 3$$

$$\Rightarrow \frac{2 \times 3(x - 9) + 7x}{21} = 3$$

$$\Rightarrow 6(x - 9) + 7x = 3 \times 21$$

$$\Rightarrow 6x - 54 + 7x = 63$$

$$\Rightarrow 13x = 63 + 54$$

$$\Rightarrow 13x = 117$$

$$\Rightarrow x = 9$$

CHECK: Substituting $x=9$ in the given equation we get.

$$\text{LHS} = \frac{2}{7}(x - 9) + \frac{x}{3}$$

$$= \frac{2}{7}(9 - 9) + \frac{x}{3}$$

$$= 0 + \frac{9}{3}$$

$$= \frac{9}{3}$$

$$= 3$$

$$\text{RHS} = 3$$

$$\therefore \text{LHS} = \text{RHS}$$

Hence, $x=9$ is a solution of the given equation.

Q23

Answer :

We have:

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

$$\Rightarrow \frac{4(2x-3) + 5(x+3)}{20} = \frac{4x+1}{7}$$

$$\Rightarrow \frac{8x-12+5x+15}{20} = \frac{4x+1}{7}$$

$$\Rightarrow \frac{13x+3}{20} = \frac{4x+1}{7}$$

$$\Rightarrow 7(13x+3) = 20(4x+1)$$

$$\Rightarrow 91x+21 = 80x+20$$

$$\Rightarrow 91x-80x = 20-21$$

$$\Rightarrow 11x = -1$$

$$\Rightarrow x = \frac{-1}{11}$$

CHECK: Substituting $x = -\frac{1}{11}$ in the given equation, we get:

LHS:

$$\begin{aligned} \text{LHS} &= \frac{2x-3}{5} + \frac{x+3}{4} \\ &= \frac{2 \times \frac{-1}{11} - 3}{5} + \frac{-\frac{1}{11} + 3}{4} \\ &= \frac{-2-33}{55} + \frac{33-1}{44} \\ &= -\frac{35}{55} + \frac{32}{44} \\ &= \frac{-140+160}{220} \\ &= \frac{20}{220} = \frac{1}{11} \end{aligned}$$

$$\begin{aligned} \text{RHS} &= \frac{4x+1}{7} \\ &= \frac{4 \times \left(-\frac{1}{11}\right) + 1}{7} \\ &= \frac{-4+11}{7 \times 11} \\ &= \frac{7}{77} \\ &= \frac{1}{11} \end{aligned}$$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = \frac{-1}{11}$ is a solution of the given equation.

Q24

Answer :

We have:

$$\begin{aligned} \frac{3}{4} (7x-1) - \left(2x - \frac{1-x}{2}\right) &= x + \frac{3}{2} \\ \Rightarrow \frac{3}{4} (7x-1) - 2x + \frac{1-x}{2} - x &= \frac{3}{2} \\ \Rightarrow \frac{3 \times 7}{4} x - \frac{3}{4} - 2x + \frac{1}{2} - \frac{x}{2} - x &= \frac{3}{2} \end{aligned}$$

$$\Rightarrow \frac{21}{4}x - 2x - \frac{x}{2} - x = \frac{3}{2} + \frac{3}{4} - \frac{1}{2} \quad (\text{By transposition})$$

$$\Rightarrow \frac{21x - 8x - 2x - 4x}{4} = 1 + \frac{3}{4}$$

$$\Rightarrow \frac{21x - 14x}{4} = \frac{7}{4}$$

$$\Rightarrow \frac{7x}{4} = \frac{7}{4}$$

$$\Rightarrow x = 1$$

CHECK: Substituting $x=1$ in the given equation, we get:

$$\text{LHS} = \frac{3}{4} \left(7x - 1 \right) - \left(2x - \frac{1-x}{2} \right)$$

$$= \frac{3}{4} \left(7 \times 1 - 1 \right) - \left(2 \times 1 - \frac{1-1}{2} \right)$$

$$= \frac{3}{4} \times 6 - 2$$

$$= \frac{9}{2} - 2$$

$$= \frac{9-4}{2}$$

$$= \frac{5}{2}$$

$$\text{RHS} = x + \frac{3}{2}$$

$$= 1 + \frac{3}{2}$$

$$= \frac{2+3}{2}$$

$$= \frac{5}{2}$$

$$\therefore \text{LHS} = \text{RHS}$$

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

Q25

Answer :

We have :

$$\frac{x+2}{6} - \left(\frac{11-x}{3} - \frac{1}{4} \right) = \frac{3x-4}{12}$$

$$\begin{aligned}
&\Rightarrow \frac{x+2}{6} - \left(\frac{11-x}{3} \right) + \frac{1}{4} = \frac{3x-4}{12} \\
&\Rightarrow \frac{x+2}{6} - \left(\frac{11-x}{3} \right) - \frac{3x-4}{12} = -\frac{1}{4} \quad (\text{By transposition}) \\
&\Rightarrow \frac{2(x+2)-4(11-x)-1(3x-4)}{12} = -\frac{1}{4} \\
&\Rightarrow \frac{2x+4-44+4x-3x+4}{12} = -\frac{1}{4} \\
&\Rightarrow 3x-36 = -\frac{1}{4} \times 12 \\
&\Rightarrow 3x = -3+36 \\
&\Rightarrow x = \frac{33}{3} \\
&\Rightarrow x = 11
\end{aligned}$$

CHECK: Substituting $x=11$ in the given equation, we get:

$$\begin{aligned}
\text{LHS} &= \frac{x+2}{6} - \left(\frac{11-x}{3} - \frac{1}{4} \right) \\
&= \frac{11+2}{6} - \left(\frac{11-11}{3} - \frac{1}{4} \right) \\
&= \frac{13}{6} - \left(-\frac{1}{4} \right) \\
&= \frac{13}{6} + \frac{1}{4} \\
&= \frac{13 \times 2 + 3}{12} \\
&= \frac{29}{12} \\
\text{RHS} &= \frac{3x-4}{12} \\
&= \frac{3 \times 11 - 4}{12} \\
&= \frac{33-4}{12} \\
&= \frac{29}{12}
\end{aligned}$$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 11$ is a solution of the given equation.

Verified.

Q26

Answer :

We have:

$$\frac{9x+7}{2} - \left(x - \frac{x-2}{7}\right) = 36$$

$$\Rightarrow \frac{9x+7}{2} - x + \frac{x-2}{7} = 36$$

$$\Rightarrow \frac{7(9x+7) - 14 \times x + 2 \times (x-2)}{14} = 36$$

$$\Rightarrow \frac{63x+49-14x+2x-4}{14} = 36$$

$$\Rightarrow 51x + 45 = 36 \times 14$$

$$\Rightarrow 51x = 504 - 45$$

$$\Rightarrow x = \frac{459}{51}$$

$$\Rightarrow x = 9$$

$$\Rightarrow x = 9$$

CHECK: Substituting $x=9$ in the given equation, we get:

$$\text{LHS} = \frac{9x+7}{2} - \left(x - \frac{x-2}{7}\right)$$

$$= \frac{9 \times 9 + 7}{2} - \left(9 - \frac{9-2}{7}\right)$$

$$= \frac{88}{2} - 9 + \frac{7}{7}$$

$$= 44 - 9 + 1$$

$$= 36$$

$$\text{RHS} = 36$$

$\therefore \text{LHS} = \text{RHS}$

Hence, $x = 11$ is a solution of the given equation.

Verified.

Q27

Answer :

***** END *****