Exercise 7A

LHS: $\frac{1}{2}x - 3$

$= \frac{1}{\cancel{2}^{1}} \times \cancel{4}\,\cancel{8}^{24} - 3$

$= 24 - 3$

$= 21$

RHS: $5 + \frac{1}{3}x$

$= 5 + \frac{1}{\cancel{3}^{1}} \times \cancel{4}\,\cancel{8}^{16}$

$= 5 + 16$

$= 21$

$\therefore$ LHS=RHS

Hence, $x = 48$ is a solution of the given equation.

Q9

Answer :

$\frac{x}{2} + \frac{x}{4} = \frac{1}{8}$

$\Rightarrow \frac{x \times 2 + x \times 1}{4} = \frac{1}{8}$

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

$\Rightarrow \frac{3x}{4} = \frac{1}{8}$

$\Rightarrow 3x = \frac{1}{\cancel{8}^{2}} \times \cancel{4}^{1}$

$\Rightarrow 3x = \frac{1}{2}$

$\Rightarrow x = \frac{1}{6}$

CHECK: Substituting $x = \frac{1}{6}$ in the given equation, we get:

LHS: $\frac{x}{2}+\frac{x}{4}$

$=\frac{x\times 2+x\times 1}{4}$

$=\frac{2x+x}{4}$

$=\frac{3x}{4}$

$=\frac{\cancel{3}^{1}}{4}\times\frac{1}{\cancel{6}^{2}}$

$=\frac{1}{8}$

RHS: $\frac{1}{8}$

$\therefore$ LHS = RHS

Hence, $x=\frac{1}{3}$ is a solution of the given equation.

Q10

Answer :

We have:

$3x+2(x+2)=20-(2x-5)$

$\Rightarrow\ 3x+2x+4=20-2x+5$

$\Rightarrow\ 3x+2x+2x=20+5-4$ (Transposing $-2x$ to LHS and 4 to RHS)

$\Rightarrow\ 7x=21$

$\Rightarrow x=\frac{\cancel{21}^{3}}{\cancel{7}^{1}}$

$\Rightarrow x=3$

CHECK: Substituting $x=3$ in the given equation, we get:

LHS$=3x+2(x+2)$

$=3x+2x+4$

$=5x+4$

$=5\times 3+4$

$=15+4$

$=19$

RHS$=20-(2x-5)$

$=20-2x+5$

$=25-2\times 3$

$=25-6$

$=19$

$\therefore$ LHS = RHS

Hence, $x=3$ is a solution of the given equation.

Q11

Answer :

We have:

$13(y-4)-3(y-9)-5(y+4)=0$

$\Rightarrow\ 13y-52-3y+27-5y-20=0$

$\Rightarrow 13y-3y-5y=52+20-27$ (Transposing $-52,-20$ and 27 to RHS)

$\Longrightarrow 5y=45$

$\Rightarrow y=\frac{\cancel{45}^{9}}{\cancel{5}^{1}}$

$\Rightarrow y=9$

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

LHS$=13(y-4)-3(y-9)-5(y+4)$

$=13y-52-3y+27-5y-20$

$=13y-3y-5y-52+27-20$

$=5y-45$

$=5\times 9-45$

$=45-45$

$=0$

RHS$=0$

$\therefore$ LHS=RHS
Hence, $x=9$ is a solution of the given equation.

Q12

Answer :

We have,

$\frac{2m+5}{3} = 3m - 10$

$\Rightarrow 2m + 5 = 3(3m - 10)$

$\Rightarrow 2m + 5 = 9m - 30$

$\Rightarrow 2m - 9m = -30 - 5$ (Transposing $9m$ to LHS and 5 to RHS)

$\Rightarrow -7m = -35$

$\Rightarrow m = \frac{-\cancel{35}^{5}}{-\cancel{7}^{1}}$

$\Rightarrow m = 5$

CHECK: Substituting $m = 5$ in the given equation, we get:

$\text{LHS} = \frac{2m+5}{3}$

$= \frac{2\times5+5}{3}$

$= \frac{10+5}{3}$

$= \frac{\cancel{15}^{5}}{\cancel{3}^{1}}$

$= 5$

$\text{RHS} = 3m - 10$

$= 3 \times 5 - 10$

$= 15 - 10$

$= 5$

$\therefore$ LHS=RHS
Hence, $x=5$ is a solution of the given equation.

Q13

Answer :

We have:

$6(3x+2)-5(6x-1)=3(x-8)-5(7x-6)+9x$

$\Rightarrow 18x+12-30x+5=3x-24-35x+30+9x$

$\Rightarrow 18x-30x-3x+35x-9x=-24+30-12-5$ (Transposing $3x, 9x$ and $-35x$ to LHS and 12 and 5 to RHS)

$\Rightarrow 53x-42x=30-41$

$\Rightarrow 11x=-11$

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

$\Rightarrow x=-1$

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

$\text{LHS}=6(3x+2)-5(6x-1)$

$=18x+12-30x+5$

$=-12x+17$

$=-12\times(-1)+17$

$=12+17$

$=29$

$\text{RHS}=3(x-8)-5(7x-6)+9x$

$=3x-24-35x+30+9x$

$=12x-35x-24+30$

$=-23x+6$

$=-23\times(-1)+6$

$=23+6$

$=29$

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

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

Q14

Answer :

We have:

$t-(2t+5)-5(1-2t)=2(3+4t)-3(t-4)$

$\Rightarrow t-2t-5-5+10t=6+8t-3t+12$

$\Rightarrow t-2t+10t-8t+3t=6+12+5+5$ (By transposition)

$\Rightarrow 14t-10t=28$

$\Rightarrow 4t=28$

$\Rightarrow x=\frac{\cancel{28}^{7}}{\cancel{4}^{1}}$

$\Rightarrow x=7$

CHECK: Substituting $x=7$ in the given equation, we get:

$$\begin{aligned}\text{LHS}&=t-(2t+5)-5(1-2t)\\&=t-2t-5-5+10t\\&=11t-2t-10\\&=9t-10\\&=9\times 7-10\\&=63-10\\&=53\end{aligned}$$

$$\begin{aligned}\text{RHS}&=2(3+4t)-3(t-4)\\&=6+8t-3t+12\\&=5t+18\\&=5\times 7+18\\&=35+18\\&=53\end{aligned}$$

$\therefore$ LHS=RHS

Hence, $x=7$ is a solution of the given equation.

Q15

Answer :

We have:

$\frac{2}{3}x = \frac{3}{8}x + \frac{7}{12}$

$\Rightarrow \frac{2}{3}x - \frac{3}{8}x = \frac{7}{12}$ $\left(\text{Transposing } \frac{3}{8}x \text{ to LHS}\right)$

$\Rightarrow \left(\frac{2\times8-3\times3}{24}\right)x = \frac{7}{12}$

$\Rightarrow \left(\frac{16-9}{24}\right)x = \frac{7}{12}$

$\Rightarrow \frac{7}{24}x = \frac{7}{12}$

$\Rightarrow x = \frac{\cancel{7}^{1}}{\cancel{12}^{1}} \times \frac{\cancel{24}^{2}}{\cancel{7}^{1}}$

$\Rightarrow x = 2$

CHECK: Substituting $x=2$ in the given equation, we get:

$\text{LHS} = \frac{2}{3}x$

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

$= \frac{4}{3}$

$\text{RHS} = \frac{3}{8}x + \frac{7}{12}$

$= \frac{3}{8} \times 2 + \frac{7}{12}$

$= \frac{6}{8} + \frac{7}{12}$

$= \frac{6\times3+7\times2}{24}$

$= \frac{18+14}{24}$

********** END **********