NCERT SOLUTIONS FOR CLASS 8 MATHS LINEAR EQUATION IN ONE VARIABLE EX-2.5

Solve the following linear equations.

Q1. $\frac{x}{2}-\frac{1}{5}=\frac{x}{3}+\frac{1}{4}$

Ans: $\frac{x}{2}-\frac{1}{5}=\frac{x}{3}+\frac{1}{4}$

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

$\Rightarrow \frac{3x-2x}{6}=\frac{5+4}{20}$

$\Rightarrow \frac{x}{6}=\frac{9}{20}$

$\Rightarrow x=\frac{9\times 6}{20}=\frac{27}{10}$

To check:

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

$\Rightarrow \frac{27}{10\times 2}-\frac{1}{5}=\frac{27}{10\times 3}+\frac{1}{4}$

$\Rightarrow \frac{27}{20}-\frac{1}{5}=\frac{9}{10}+\frac{1}{4}$

$\Rightarrow \frac{27-4}{20}=\frac{18+5}{20}$

$\Rightarrow \frac{23}{20}=\frac{23}{20}$

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

Therefore, it is correct.

Q2. $\frac{n}{2}-\frac{3n}{4}+\frac{5n}{6}=21$

Ans: $\frac{n}{2}-\frac{3n}{4}+\frac{5n}{6}=21$

$\Rightarrow \frac{6n-9n+10n}{12}=21$

$\Rightarrow \frac{7n}{12}=21$

$\Rightarrow n=\frac{21\times12}{7}$

$\Rightarrow n=36$

To check:

$\frac{n}{2}-\frac{3n}{4}+\frac{5n}{6}=21$

$\Rightarrow \frac{36}{2}-\frac{3\times36}{4}+\frac{5\times36}{6}=21$

$\Rightarrow 18-27+30=21$

$\Rightarrow 21=21$

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

Therefore, it is correct.

Q3. $x+7-\frac{8x}{3}=\frac{17}{6}-\frac{5x}{2}$

Ans: $x+7-\frac{8x}{3}=\frac{17}{6}-\frac{5x}{2}$

$\Rightarrow \frac{x}{1}-\frac{8x}{3}+\frac{5x}{2}=\frac{17}{6}-\frac{7}{1}$

$\Rightarrow \frac{6x-16x+15x}{6}=\frac{17-42}{6}$

$\Rightarrow \frac{5x}{6}=\frac{-25}{6}$

$\Rightarrow x=\frac{-25\times6}{6\times5}$

$\Rightarrow x=-5$

To check:

$$x+7-\frac{8x}{3}=\frac{17}{6}-\frac{5x}{2}$$

$$\Rightarrow -5+7-\frac{8\times(-5)}{3}=\frac{17}{6}-\frac{5\times(-5)}{2}$$

$$\Rightarrow 2+\frac{40}{3}=\frac{17}{6}+\frac{25}{2}$$

$$\Rightarrow \frac{6+40}{3}=\frac{17+75}{6}$$

$$\Rightarrow \frac{46}{3}=\frac{92}{6}$$

$$\Rightarrow \frac{46}{3}=\frac{46}{3}$$

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

Therefore, it is correct.

Q4. $\frac{x-5}{3}=\frac{x-3}{5}$

Ans: $\frac{x-5}{3}=\frac{x-3}{5}$

$$\Rightarrow 5\times(x-5)=3(x-3)$$

$\Rightarrow 5x-25=3x-9$

$\Rightarrow 5x-3x=-9+25$

$\Rightarrow 2x=16$

$\Rightarrow x=\frac{16}{2}=8$

To check:

$\frac{x-5}{3}=\frac{x-3}{5}$

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

$\Rightarrow \frac{3}{3}=\frac{5}{5}$

$\Rightarrow 1=1$

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

Therefore, it is correct.

Q5. $\frac{3t-2}{4}-\frac{2t+3}{3}=\frac{2}{3}-t$

Ans: $\frac{3t-2}{4}-\frac{2t+3}{3}=\frac{2}{3}-t$

$\Rightarrow \frac{3t-2}{4}-\frac{2t+3}{3}+t=\frac{2}{3}$

$$\Rightarrow \frac{3(3t-2)-4(2t+3)+12t}{12}=\frac{2}{3}$$

$$\Rightarrow \frac{9t-6-8t-12+12t}{12}=\frac{2}{3}$$

$$\Rightarrow \frac{13t-18}{12}=\frac{2}{3}$$

$$\Rightarrow 3\times(13t-18)=2\times 12$$

$$\Rightarrow 39t-54=24$$

$$\Rightarrow 39t=24+54$$

$$\Rightarrow 39t=78$$

$$\Rightarrow t=\frac{78}{39}=2$$

To check:

$$\frac{3t-2}{4}-\frac{2t+3}{3}=\frac{2}{3}-t$$

$$\Rightarrow \frac{3\times 2-2}{4}-\frac{2\times 2+3}{3}=\frac{2}{3}-2$$

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

$\Rightarrow \frac{4}{4}-\frac{7}{3}=\frac{-4}{3}$

$\Rightarrow \frac{1}{1}-\frac{7}{3}=\frac{-4}{3}$

$\Rightarrow \frac{3-7}{3}=\frac{-4}{3}$

$\Rightarrow \frac{-4}{3}=\frac{-4}{3}$

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

Therefore, it is correct.

Q6. $m-\frac{m-1}{2}=1-\frac{m-2}{3}$

Ans: $m-\frac{m-1}{2}=1-\frac{m-2}{3}$

$\Rightarrow \frac{m}{1}-\frac{m-1}{2}+\frac{m-2}{3}=1$

$\Rightarrow \frac{6m-3(m-1)+2(m-2)}{6}=1$

$\Rightarrow \frac{6m-3m+3+2m-4}{6}=1$

$\Rightarrow \frac{5m-1}{6}=1$

$\Rightarrow 5m-1=6$

$\Rightarrow 5m=6+1$

$\Rightarrow 5m=7$

$\Rightarrow m=\frac{7}{5}$

To check:

$m-\frac{m-1}{2}=1-\frac{m-2}{3}$

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

$\Rightarrow \frac{7}{5}-\frac{\frac{7-5}{5}}{2}=1-\frac{\frac{7-10}{5}}{3}$

$\Rightarrow \frac{7}{5}-\frac{2}{5\times 2}=1-\frac{-3}{5\times 3}$

$\Rightarrow \frac{7}{5}-\frac{1}{5}=1+\frac{1}{5}$

$\Rightarrow \frac{7-1}{5}=\frac{5+1}{5}$

$\Rightarrow \frac{6}{5}=\frac{6}{5}$

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

Therefore, it is correct.

Simplify and solve the following linear equation.

Q7. $3(t-3)=5(2t+1)$

Ans: $3(t-3)=5(2t+1)$

$\Rightarrow 3t-9=10t+5$

$\Rightarrow 3t-10t=5+9$

$\Rightarrow -7t=14$

$\Rightarrow t=\frac{14}{-7}$

$\Rightarrow t=-2$

To check:

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

$\Rightarrow 3(-2-3)=5\{2\times(-2)+1\}$

$\Rightarrow 3\times-5=5(-4+1)$

$\Rightarrow -15=5\times(-3)$

$\Rightarrow -15=-15$

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

Therefore, it is correct.

Q8. $15(y-4)-2(y-9)+5(y+6)=0$

Ans: $15(y-4)-2(y-9)+5(y+6)=0$

$\Rightarrow 15y-60-2y+18+5y+30=0$

$\Rightarrow 18y-12=0$

$\Rightarrow 18y=12$

$\Rightarrow y=\frac{12}{18}$

$\Rightarrow y=\frac{2}{3}$

To check:

$$15(y-4)-2(y-9)+5(y+6)=0$$

$$\Rightarrow 15\left(\frac{2}{3}-4\right)-2\left(\frac{2}{3}-9\right)+5\left(\frac{2}{3}+6\right)=0$$

$$\Rightarrow 15\left(\frac{2-12}{3}\right)-2\left(\frac{2-27}{3}\right)+5\left(\frac{2+18}{3}\right)=0$$

$$\Rightarrow 15\times\frac{-10}{3}-2\times\frac{-25}{3}+5\times\frac{20}{3}=0$$

$$\Rightarrow -50+\frac{50}{3}+\frac{100}{3}=0$$

$$\Rightarrow -50+\frac{50+100}{3}=0$$

$$\Rightarrow -50+\frac{150}{3}=0$$

$$\Rightarrow -50+50=0$$

$$\Rightarrow 0=0$$

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

Therefore, it is correct.

Q9. $3(5z-7)-2(9z-11)=4(8z-13)-17$

Ans: $3(5z-7)-2(9z-11)=4(8z-13)-17$

$\Rightarrow 15z-21-18z+22=32z-52-17$

$\Rightarrow -3z+1=32z-69$

$\Rightarrow -3z-32z=-69-1$

$\Rightarrow -35z=-70$

$\Rightarrow z=\frac{-70}{-35}=2$

To check:

$3(5z-7)-2(9z-11)=4(8z-13)-17$

$\Rightarrow 3(5\times 2-7)-2(9\times 2-11)=4(8\times 2-13)-17$

$\Rightarrow 3(10-7)-2(18-11)=4(16-13)-17$

$\Rightarrow 3\times 3-2\times 7=4\times 3-17$

$\Rightarrow 9-14=12-17$

$\Rightarrow -5=-5$

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

Therefore, it is correct.

Q10. $0.25(4f-3)=0.05(10f-9)$

Ans: $0.25(4f-3)=0.05(10f-9)$

$\Rightarrow 1.00f-0.75=0.50f-0.45$

$\Rightarrow 1.00f-0.50f=-0.45+0.75$

$\Rightarrow 0.50f=0.3$

$\Rightarrow f=\frac{0.3}{0.50}$

$\Rightarrow f=0.6$

To check:

$0.25(4f-3)=0.05(10f-9)$

$\Rightarrow 0.25(4\times0.6-3)=0.05(10\times0.6-9)$

$\Rightarrow 0.25(2.4-3)=0.05(6.0-9)$

$\Rightarrow 0.25\times(-0.6)=0.05\times(-3)$

$\Rightarrow -0.150=-0.150$

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

Therefore, it is correct.

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