Linear Equations in One Variable Ex 9.3 Q11

Answer :

$\frac{2}{3x} - \frac{3}{2x} = \frac{1}{12}$

or, $\frac{4-9}{6x} = \frac{1}{12}$

or, $\frac{-5}{x} = \frac{1}{2}$

or, $x = -10$ $\left[\text{After cross multiplication}\right]$

Thus, $x = -10$ is the solution of the given equation.

Check :

Substituting $x = -10$ in the given equation, we get :

$L.H.S. = \frac{2}{3(-10)} - \frac{3}{2(-10)} = \frac{2}{-30} - \frac{3}{-20} = \frac{4-9}{-60} = \frac{-5}{-60} = \frac{1}{12}$

$R.H.S. = \frac{1}{12}$

$\therefore$ L.H.S. = R.H.S. for $x = -10$.

Linear Equations in One Variable Ex 9.3 Q12

Answer :

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

or, $12x^2 + 20x + 21x + 35 = 12x^2 + 16x + 6x + 8$ $\left[\text{Cross multiply}\right]$

or, $12x^2 - 12x^2 + 41x - 22x = 8 - 35$

or, $19x = -27$

or, $x = \frac{-27}{19}$

Thus, $x = \frac{-27}{19}$ is the solution of the given equation

Check :

Substituting $x = \frac{-27}{19}$ in the given equation, we get :

$L.H.S. = \frac{3\left(\frac{-27}{19}\right)+5}{4\left(\frac{-27}{19}\right)+2} = \frac{-81+95}{-108+38} = \frac{14}{-70} = \frac{-1}{5}$

$R.H.S. = \frac{3\left(\frac{-27}{19}\right)+4}{4\left(\frac{-27}{19}\right)+7} = \frac{-81+76}{-108+133} = \frac{-5}{25} = \frac{-1}{5}$

$\therefore$ L.H.S. = R.H.S. for $x = \frac{-27}{19}$

Linear Equations in One Variable Ex 9.3 Q13

Answer :

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

or $35x^2 + 28x - 10x - 8 = 35x^2 + 15x - 7x - 3$ [After cross multiplication]

or $35x^2 - 35x^2 + 18x - 8x = -3 + 8$

or $10x = 5$

or $x = \frac{5}{10}$ or $x = \frac{1}{2}$

Thus, $x = \frac{1}{2}$ is the solution of the given equation.

Check :

Substituting $x = \frac{1}{2}$ in the given equation, we get :

$L.H.S. = \frac{7\left(\frac{1}{2}\right)-2}{5\left(\frac{1}{2}\right)-1} = \frac{7-4}{5-2} = \frac{3}{3} = 1$

$R.H.S. = \frac{7\left(\frac{1}{2}\right)+3}{5\left(\frac{1}{2}\right)+4} = \frac{7+6}{5+8} = \frac{13}{13} = 1$

$\therefore$ L.H.S. = R.H.S. for $x = \frac{1}{2}$

Linear Equations in One Variable Ex 9.3 Q14

Answer :

$\left(\frac{x+1}{x+2}\right)^2 = \frac{x+2}{x+4}$

or $\frac{x^2+2x+1}{x^2+4x+4} = \frac{x+2}{x+4}$

or $x^3 + 2x^2 + x + 4x^2 + 8x + 4 = x^3 + 4x^2 + 4x + 2x^2 + 8x + 8$

[After cross multiplication]

or $x^3 - x^3 + 6x^2 - 6x^2 + 9x - 12x = 8 - 4$

or $-3x = 4$

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

Thus, $x = \frac{-4}{3}$ is the solution of the given equation.

Check :

Substituting $x = \frac{-4}{3}$ in the given equation, we get :

$L.H.S. = \left(\frac{\frac{-4}{3}+1}{\frac{-4}{3}+2}\right)^2 = \left(\frac{-4+3}{-4+6}\right)^2 = \frac{1}{4}$

$R.H.S. = \frac{\frac{-4}{3}+2}{\frac{-4}{3}+4} = \frac{-4+6}{-4+12} = \frac{2}{8} = \frac{1}{4}$

$\therefore$ L.H.S. = R.H.S. for $x = \frac{-4}{3}$

Linear Equations in One Variable Ex 9.3 Q15

Answer :

$\left(\frac{x+1}{x-4}\right)^2 = \frac{x+8}{x-2}$

or $\frac{x^2+2x+1}{x^2-8x+16} = \frac{x+8}{x-2}$ $\quad \left[\left(a+b\right)^2 = a^2+b^2+2ab \text{ and } \left(a-b\right)^2 = a^2+b^2-2ab\right]$

or $x^3+2x^2+x-2x^2-4x-2 = x^3-8x^2+16x+8x^2-64x+128$

$\left[\text{After cross multiplication}\right]$

or $x^3-x^3-3x+48x = 128+2$

or $45x = 130$

or $x = \frac{130}{45} = \frac{26}{9}$

Thus $x = \frac{26}{9}$ is the solution of the given equation.

Check :

Substituting $x = \frac{26}{9}$ in the given equation, we get :

$\text{L.H.S.} = \left(\frac{\frac{26}{9}+1}{\frac{26}{9}-4}\right)^2 = \left(\frac{26+9}{26-36}\right)^2 = \frac{1225}{100} = \frac{49}{4}$

$\text{R.H.S.} = \left(\frac{\frac{26}{9}+8}{\frac{26}{9}-2}\right) = \left(\frac{26+72}{26-18}\right) = \frac{98}{8} = \frac{49}{4}$

$\therefore$ L.H.S. = R.H.S. for $x = \frac{26}{9}$

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