Exercise 8A

Q9.

Answer :

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

$\Rightarrow 10\left(\frac{x-5}{2}\right) - 10\left(\frac{x-3}{5}\right) = 10\left(\frac{1}{2}\right)$ (multiplying throughout by 10, which is the L.C.M. of 2, 2 and 5) $\Rightarrow 5\left(x-5\right) - 2\left(x-3\right) = 5 \Rightarrow 5x - 25 - 2x + 6 = 5 \Rightarrow 5x - 2x - 25 + 6 = 5 \Rightarrow 3x - 19 = 5 \Rightarrow 3x = 5 + 19 \Rightarrow 3x = 24 \Rightarrow x = \frac{24}{3} = 8 \therefore x = 8$

Q10.

Answer :

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

$\Rightarrow \frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2-3t}{3}$ (3 is the L.C.M. of 1 and 3)

$\Rightarrow 12\left(\frac{3t-2}{4}\right) - 12\left(\frac{2t+3}{3}\right) = 12\left(\frac{2-3t}{3}\right)$ (multiplying throughout by 12, which is the L.C.M. of 4, 3 and 3)

$\Rightarrow 3\left(3t-2\right) - 4\left(2t+3\right) = 4\left(2-3t\right)$

$\Rightarrow 9t - 6 - 8t - 12 = 8 - 12t$

$\Rightarrow 9t - 8t - 6 - 12 = 8 - 12t$

$\Rightarrow t - 18 = 8 - 12t$

$\Rightarrow t + 12t = 18 + 8$

$\Rightarrow 13t = 26$

$\Rightarrow t = \frac{26}{13} = 2$

$\therefore t = 2$

Q11.

Answer :

$\frac{2x+7}{5} - \frac{3x+11}{2} = \frac{2x+8}{3} - 5$

$\Rightarrow \frac{2x+7}{5} - \frac{3x+11}{2} = \frac{2x+8-15}{3}$ (L.C.M. of 3 and 1 is 3)

$\Rightarrow 30\left(\frac{2x+7}{5}\right) - 30\left(\frac{3x+11}{2}\right) = 30\left(\frac{2x+8-15}{3}\right)$

(multiplying throughout by 30, which is the L.C.M. of 5, 2 and 3)

$\Rightarrow 6\left(2x+7\right) - 15\left(3x+11\right) = 10\left(2x+8-15\right) \Rightarrow 12x + 42 - 45x - 165 = 20x - 70 \Rightarrow 12x - 45x + 42 - 165 = 20x - 70 \Rightarrow -33x - 123 = 20x - 70 \Rightarrow -33x - 20x = 123 - 70 \Rightarrow -53x = 53 \Rightarrow x = \frac{53}{-53} \Rightarrow x = -1 \therefore x = -1$

Q12.

Answer :

$\frac{5x-4}{6} = 4x + 1 - \frac{3x+10}{2}$

$\Rightarrow \frac{5x-4}{6} = \frac{2\left(4x+1\right)-3x-10}{2}$ (L.C.M. of 1 and 2 is 2)

$\Rightarrow \frac{5x-4}{6} = \frac{8x+2-3x-10}{2}$

$\Rightarrow \frac{5x-4}{6} = \frac{8x-3x+2-10}{2}$

$\Rightarrow \frac{5x-4}{6} = \frac{5x-8}{2}$

$\Rightarrow 2\left(5x-4\right) = 6\left(5x-8\right)$

$\Rightarrow 10x - 8 = 30x - 48$

$\Rightarrow 10x - 30x = -48 + 8$

$\Rightarrow -20x = -40$

$\Rightarrow x = \frac{-40}{-20} = 2$

$\therefore x = 2$

Q13.

Answer :

$$5x - \frac{1}{3}\left(x + 1\right) = 6\left(x + \frac{1}{30}\right)$$

$$\Rightarrow 5x - \frac{1(x+1)}{3} = 6\left(\frac{30x+1}{30}\right) \quad \left(\text{L.C.M. of } 1 \text{ and } 30 \text{ is } 30\right)$$

$$\Rightarrow 5x - \frac{(x+1)}{3} = \frac{30x+1}{5}$$

$$\Rightarrow \frac{15x - x - 1}{3} = \frac{30x+1}{5} \quad \left(\text{L.C.M. of } 1 \text{ and } 3 \text{ is } 3\right)$$

$$\Rightarrow \frac{14x-1}{3} = \frac{30x+1}{5}$$

$$\Rightarrow 5\left(14x - 1\right) = 3\left(30x + 1\right) \quad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 70x - 5 = 90x + 3$$

$$\Rightarrow 70x - 90x = 3 + 5$$

$$\Rightarrow -20x = 8$$

$$\Rightarrow x = \frac{8}{-20} = \frac{-2}{5}$$

$$\therefore x = -\frac{2}{5}$$

Q14.

Answer :

$$4 - \frac{2(z-4)}{3} = \frac{1}{2}\left(2z+5\right)$$

$$\Rightarrow \frac{12 - 2(z-4)}{3} = \frac{1(2z+5)}{2} \quad \left(\text{L.C.M. of } 1 \text{ and } 3 \text{ is } 3\right)$$

$$\Rightarrow \frac{12 - 2z + 8}{3} = \frac{2z+5}{2}$$

$$\Rightarrow \frac{20 - 2z}{3} = \frac{2z+5}{2}$$

$\Rightarrow 2\left(20-2z\right) = 3\left(2z+5\right) \quad \left(\text{by cross multiplication}\right)$

$\Rightarrow 40 - 4z = 6z + 15$

$\Rightarrow 40 - 15 = 6z + 4z$

$\Rightarrow 25 = 10z$

$\Rightarrow 10z = 25 \quad \left(\text{by transposition}\right)$

$\Rightarrow z = \frac{25}{10} = \frac{5}{2}$

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

Q15.

Answer :

$\frac{3(y-5)}{4} - 4y = 3 - \frac{(y-3)}{2}$

$\Rightarrow \frac{3y-15}{4} - 4y = 3 - \frac{y-3}{2}$

$\Rightarrow \frac{3y-15-16y}{4} = 3 - \frac{y-3}{2} \quad \left(\text{L.C.M. of } 4 \text{ and } 1 \text{ is } 4\right)$

$\Rightarrow \frac{-13y-15}{4} = \frac{6-y+3}{2}$

$\Rightarrow \frac{-13y-15}{4} = \frac{9-y}{2}$

$\Rightarrow 2\left(-13y-15\right) = 4\left(9-y\right)$

$\Rightarrow -26y - 30 = 36 - 4y$

$\Rightarrow -26y + 4y = 36 + 30$

$\Rightarrow -22y = 66$

$\Rightarrow 22y = -66 \quad \left(\text{multiplying both the sides with a } -\text{ve sign}\right)$

$\Rightarrow y = -\frac{66}{22} = -3$

$\therefore y = -3$

Q16.

Answer :

$\frac{8x-3}{3x} = 2$

$\Rightarrow 8x - 3 = 2\left(3x\right)$ (by cross multiplication)

$\Rightarrow 8x - 3 = 6x$

$\Rightarrow 8x - 6x = 3$

$\Rightarrow 2x = 3$

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

$\therefore x = \frac{3}{2}$

Q17.

Answer :

$\frac{9x}{7-6x} = 15$

$\Rightarrow \frac{9x}{7-6x} = \frac{15}{1}$

$\Rightarrow 1\left(9x\right) = 15\left(7-6x\right)$ (by cross multiplication)

$\Rightarrow 9x = 105 - 90x$

$\Rightarrow 9x + 90x = 105$

$\Rightarrow 99x = 105$

$\Rightarrow x = \frac{105}{99} = \frac{35}{33}$

$\therefore x = \frac{35}{33}$

Q18.

Answer :

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

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

$\Rightarrow 1\left(3x\right) = -4\left(5x+2\right)$ (by cross multiplication)

$\Rightarrow 3x = -20x - 8$

$\Rightarrow 3x + 20x = -8$

$\Rightarrow 23x = -8$

$\Rightarrow x = \frac{-8}{23}$

$\therefore x = \frac{-8}{23}$

Q20.

Answer :

$$\frac{2-9z}{17-4z} = \frac{4}{5}$$

$$\Rightarrow 5\left(2-9z\right) = 4\left(17-4z\right) \quad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 10 - 45z = 68 - 16z$$

$$\Rightarrow 10 - 68 = 45z - 16z$$

$$\Rightarrow -58 = 29z$$

$$\Rightarrow 29z = -58 \quad \left(\text{by transposition}\right)$$

$$\Rightarrow z = \frac{-58}{29} = -2$$

$$\therefore z = -2$$

Q21.

Answer :

$$\frac{4x+7}{9-3x} = \frac{1}{4}$$

$$\Rightarrow 4\left(4x+7\right) = 1\left(9-3x\right) \quad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 16x + 28 = 9 - 3x$$

$$\Rightarrow 16x + 3x = 9 - 28$$

$$\Rightarrow 19x = -19$$

$$\Rightarrow x = \frac{-19}{19} = -1$$

$$\therefore x = -1$$

Q22.

Answer :

$$\frac{7y+4}{y+2} = \frac{-4}{3}$$

$$\Rightarrow 3\left(7y+4\right) = -4\left(y+2\right) \quad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 21y + 12 = -4y - 8$$

$$\Rightarrow 21y + 4y = -8 - 12$$

$$\Rightarrow 25y = -20$$

$$\Rightarrow y = \frac{-20}{25} = \frac{-4}{5}$$

$$\therefore y = \frac{-4}{5}$$

Q23.

Answer :

$$\frac{15\left(2-y\right)-5\left(y+6\right)}{1-3y} = 10$$

$$\Rightarrow \frac{30-15y-5y-30}{1-3y} = 10$$

$$\Rightarrow \frac{-20y}{1-3y} = 10$$

$$\Rightarrow 1\left(-20y\right) = 10\left(1-3y\right) \quad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow -20y = 10 - 30y$$

$$\Rightarrow -20y + 30y = 10$$

$$\Rightarrow 10y = 10$$

$$\Rightarrow y = \frac{10}{10} = 1$$

$$\therefore y = 1$$

Q24.

Answer :

$$\frac{2x-(7-5x)}{9x-(3+4x)} = \frac{7}{6}$$

$$\Rightarrow \frac{2x-7+5x}{9x-3-4x} = \frac{7}{6}$$

$$\Rightarrow \frac{7x-7}{5x-3} = \frac{7}{6}$$

$$\Rightarrow 6\left(7x-7\right) = 7\left(5x-3\right) \quad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 42x - 42 = 35x - 21$$

$$\Rightarrow 42x - 35x = 42 - 21$$

$$\Rightarrow 7x = 21$$

$$\Rightarrow x = \frac{21}{7} = 3$$

$$\therefore x = 3$$

Q25.

Answer :

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

$$\Rightarrow \frac{2m-m+1}{2} = 1 - \frac{(m-2)}{3} \qquad \left(L.C.M. \text{ of } 1 \text{ and } 2 \text{ is } 2\right)$$

$$\Rightarrow \frac{m+1}{2} = \frac{3-m+2}{3} \qquad \left(L.C.M. \text{ of } 1 \text{ and } 3 \text{ is } 3\right)$$

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

$$\Rightarrow 3\left(m+1\right) = 2\left(5-m\right) \qquad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 3m + 3 = 10 - 2m$$

$$\Rightarrow 3m + 2m = 10 - 3$$

$$\Rightarrow 5m = 7$$

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

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

Q26.

Answer :

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

$$\Rightarrow \left(4x+7\right)\left(3x+5\right) = \left(4x+2\right)\left(3x+4\right) \qquad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 12x^2 + 20x + 21x + 35 = 12x^2 + 16x + 6x + 8$$

$$\Rightarrow 12x^2 + 41x + 35 = 12x^2 + 22x + 8$$

$$\Rightarrow 12x^2 - 12x^2 + 41x - 22x = 8 - 35$$

$$\Rightarrow 19x = -27$$

$$\Rightarrow x = \frac{-27}{19}$$

$$\therefore x = \frac{-27}{19}$$

Q27.

Answer :

$$\frac{9x-7}{3x+5} = \frac{3x-4}{x+6}$$

$$\Rightarrow \left(x+6\right)\left(9x-7\right) = \left(3x+5\right)\left(3x-4\right)$$

$$\left(\text{by cross multiplication}\right)$$

$$\Rightarrow 9x^2 - 7x + 54x - 42 = 9x^2 - 12x + 15x - 20$$

$$\Rightarrow 9x^2 + 47x - 42 = 9x^2 + 3x - 20$$

$$\Rightarrow 9x^2 - 9x^2 + 47x - 3x = -20 + 42$$

$$\Rightarrow 44x = 22$$

$$\Rightarrow x = \frac{22}{44} = \frac{1}{2}$$

$$\therefore x = \frac{1}{2}$$

Q28.

Answer :

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

$$\Rightarrow \left(4+5x\right)\left(2-7x\right) = \left(1-5x\right)\left(3+7x\right) \qquad \left(\text{by cross multiplication}\right)$$

$$\Rightarrow 8 - 28x + 10x - 35x^2 = 3 + 7x - 15x - 35x^2$$

$$\Rightarrow -35x^2 - 18x + 8 = -35x^2 - 8x + 3$$

$$\Rightarrow -35x^2 + 35x^2 - 18x + 8x = -8 + 3$$

$$\Rightarrow -10x = -5$$

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

$$\therefore x = \frac{1}{2}$$

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