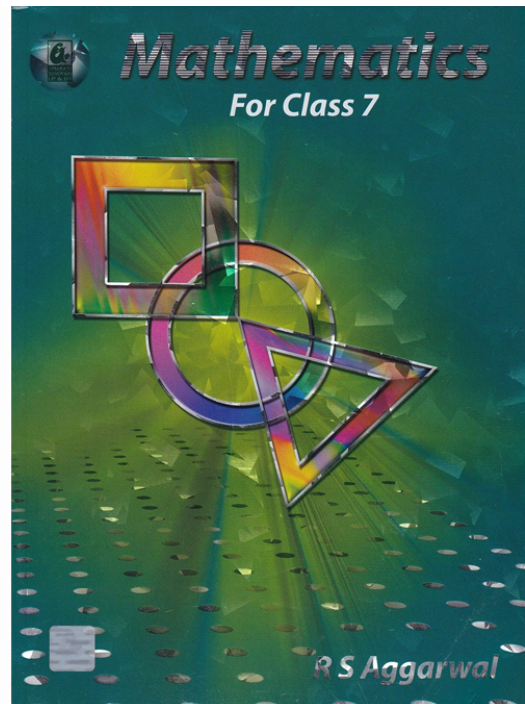


# RS Aggarwal Solutions for Class 7 Maths Chapter 7–Linear Equations in One Variable

## Class 7 - Chapter 7 Linear Equations in One Variable



For any clarifications or questions you can write to [info@indcareer.com](mailto:info@indcareer.com)

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# RS Aggarwal Solutions for Class 7 Maths Chapter 7–Linear Equations in One Variable

Class 7: Maths Chapter 7 solutions. Complete Class 7 Maths Chapter 7 Notes.

## RS Aggarwal Solutions for Class 7 Maths Chapter 7–Linear Equations in One Variable

RS Aggarwal 7th Maths Chapter 7, Class 7 Maths Chapter 7 solutions

### Ex 7A

Solve the following equations. Check your result in each case.

#### Question 1.

**Solution:**

$$3x - 5 = 0$$

Adding 5 to both sides

$$3x - 5 + 5 = 0 + 5$$

$$\Rightarrow 3x = 5$$

$$\Rightarrow x = 53$$

Check:

$$\text{L.H.S.} = 3x - 5$$

$$= 3 \times 53 - 5$$

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$$= 5 - 5$$

$$= 0$$

$$= \text{R.H.S.}$$

Hence  $x = 53$

### Question 2.

**Solution:**

$$8x - 3 = 9 - 2x$$

$$\Rightarrow 8x + 2x = 9 + 3 \text{ (By transposing)}$$

$$\Rightarrow 10x = 12$$

$$\Rightarrow x = \frac{12}{10} = \frac{6}{5}$$

$$\therefore x = \frac{6}{5}$$

Check:

$$\text{L.H.S.} = 8x - 3 = 8 \times \frac{6}{5} - 3$$

$$= \frac{48}{5} - \frac{3}{1} = \frac{48-15}{5} = \frac{33}{5}$$

$$\text{R.H.S.} = 9 - 2x = 9 - 2 \times \frac{6}{5} = \frac{9}{1} - \frac{12}{5}$$

$$= \frac{45-12}{5} = \frac{33}{5}$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

$$\text{Hence } x = \frac{6}{5}$$

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**Question 3.****Solution:**

$$7 - 5x = 5 - 7x$$

$$\Rightarrow -5x + 7x = 5 - 7 \text{ (By transposing)}$$

$$\Rightarrow 2x = -2$$

$$x = -1$$

Check:

$$\text{L.H.S.} = 7 - 5x = 7 - 5(-1) = 7 + 5 = 12$$

$$\text{R.H.S.} = 5 - 7x = 5 - 7(-1) = 5 + 7 = 12$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = -1$

**Question 4.****Solution:**

$$3 + 2x = 1 - x$$

$$\Rightarrow 2x + x = 1 - 3 \text{ (By transposing)}$$

$$\Rightarrow 3x = -2$$

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

Check :

$$\text{L.H.S.} = 3 + 2x = 3 + 2\left(\frac{-2}{3}\right)$$

$$= \frac{3}{1} - \frac{4}{3} = \frac{9-4}{3} = \frac{5}{3}$$

$$\text{R.H.S.} = 1 - x = 1 - \left(\frac{-2}{3}\right) = 1 + \frac{2}{3}$$

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

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

$$\text{Hence } x = \frac{-2}{3}$$

**Question 5.**

**Solution:**

$$2(x - 2) + 3(4x - 1) = 0$$

$$\Rightarrow 2x - 4 + 12x - 3 = 0$$

$$\Rightarrow 2x + 12x = 4 + 3 \text{ (By transposing)}$$

$$\Rightarrow 14x = 7$$

$$\Rightarrow x = \frac{7}{14} = \frac{1}{2}$$

$$\text{Check : L.H.S.} = 2(x - 2) + 3(4x - 1)$$

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

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

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

$$= -3 + 3 = 0 = \text{R.H.S.}$$

$$\text{Hence } x = \frac{1}{2}$$

**Question 6.****Solution:**

$$5(2x - 3) - 3(3x - 7) = 5$$

$$\Rightarrow 10x - 15 - 9x + 21 = 5$$

$$\Rightarrow 10x - 9x - 15 + 21 = 5$$

$$\Rightarrow 10x - 9x = 5 + 15 - 21 \text{ (By transposing)}$$

$$\Rightarrow x = 20 - 21 = -1$$

$$\Rightarrow x = -1$$

Check:

$$\text{L.H.S.} = 5(2x - 3) - 3(3x - 7)$$

$$= 5[2 \times (-1) - 3] - 3[3(-1) - 7] = 5[-2 - 3] - 3[-3 - 7]$$

$$= 5 \times (-5) - 3 \times (-10)$$

$$= -25 + 30$$

$$= 5 = \text{R.H.S.}$$

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Hence  $x = -1$

**Question 7.**

**Solution:**

$$\Rightarrow 3x = \frac{8}{15}$$

$$\Rightarrow x = \frac{8}{15} \times \frac{1}{3} = \frac{8}{45}$$

$$x = \frac{8}{45}$$

Check :

$$\begin{aligned} \text{L.H.S.} &= 2x - \frac{1}{3} = 2 \times \frac{8}{45} - \frac{1}{3} = \frac{16}{45} - \frac{1}{3} \\ &= \frac{16-15}{45} = \frac{1}{45} \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= \frac{1}{5} - x = \frac{1}{5} - \frac{8}{45} \\ &= \frac{9-8}{45} = \frac{1}{45} \end{aligned}$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

$$\text{Hence } x = \frac{8}{45}$$

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

$$\Rightarrow 2x + x = \frac{1}{5} + \frac{1}{3} \text{ (By transposing)}$$

$$\Rightarrow 3x = \frac{3+5}{15}$$

**Question 8.**

**Solution:**

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

$$\Rightarrow \frac{1}{2}x - \frac{1}{3}x = 5 + 3 \quad (\text{By transposing})$$

$$\Rightarrow \frac{3x - 2x}{6} = 8 \quad \Rightarrow \quad \frac{x}{6} = 8$$

$$\Rightarrow x = 8 \times 6 \quad \Rightarrow \quad x = 48$$

$$\therefore x = 48$$

Check:

$$\begin{aligned} \text{L.H.S.} &= \frac{1}{2}x - 3 = \frac{1}{2} \times 48 - 3 \\ &= 24 - 3 = 21 \end{aligned}$$

$$\text{R.H.S.} = 5 + \frac{1}{3}x = 5 + \frac{1}{3} \times 48 = 5 + 16 = 21$$

L.H.S. = R.H.S.

Hence  $x = 48$

**Question 9.**

**Solution:**

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

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

$$\Rightarrow x = \frac{1}{8} \times \frac{4}{3} = \frac{1}{6}$$

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

Check :

$$\begin{aligned} \text{L.H.S.} &= \frac{x}{2} + \frac{x}{4} = \frac{1}{6 \times 2} + \frac{1}{6 \times 4} = \frac{1}{12} + \frac{1}{24} \\ &= \frac{2+1}{24} = \frac{3}{24} = \frac{1}{8} = \text{R.H.S.} \end{aligned}$$

$$\text{Hence } x = \frac{1}{6}$$

#### Question 10.

**Solution:**

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

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

$$\Rightarrow 5x + 4 = 25 - 2x$$

$$\Rightarrow 5x + 2x = 25 - 4 \text{ (By transposing)}$$

$$\Rightarrow 7x = 21$$

$$\Rightarrow x = 3$$

Check:

$$\text{L.H.S.} = 3x + [2(x + 2)] = 3 \times 3 + 2(3 + 2) = 9 + 2 \times 5 = 9 + 10 = 19$$

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$$\text{R.H.S.} = 20 - (2x - 5) = 20 - (2 \times 3 - 5) = 20 - (6 - 5) = 20 - 1 = 19$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = 3$

**Question 11.**

**Solution:**

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

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

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

$$\Rightarrow 13y - 8y - 72 + 27 = 0$$

$$\Rightarrow 5y - 45 = 0$$

$$\Rightarrow 5y = 45 \text{ (By transposing)}$$

$$\Rightarrow y = 9$$

Check:

$$\text{L.H.S.} = 13(y - 4) - 3(y - 9) - 5(y + 4)$$

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

$$= 13 \times 5 - 3 \times 0 - 5 \times 13$$

$$= 65 - 0 - 65 = 0 = \text{R.H.S.}$$

Hence  $y = 9$

**Question 12.**

**Solution:**

$$2m + 53 = 3m - 10$$

$$\Rightarrow 2m + 5 = 3(3m - 10) \text{ (By cross multiplication)}$$

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

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

$$\Rightarrow -7m = -35$$

$$\Rightarrow m = 5$$

$$m = 5$$

Check:

$$\begin{aligned}\text{L.H.S.} &= \frac{2m+5}{3} = \frac{2 \times 5 + 5}{3} \\ &= \frac{10+5}{3} = \frac{15}{3} = 5\end{aligned}$$

$$\text{R.H.S.} = 3m - 10 = 3 \times 5 - 10 = 15 - 10 = 5$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence  $m = 5$

### Question 13.

**Solution:**

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

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

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

$$\Rightarrow -12x + 17 = -23x + 6$$

$$\Rightarrow -12x + 23x = 6 - 17$$

$$\Rightarrow 11x = -11$$

$$x = -1$$

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Check:

$$\text{L.H.S.} = 6(3x + 2) - 5(6x - 1)$$

$$= 6[3x(-1) + 2] - 5[6 \times (-1) \times -1]$$

$$= 6[-3 + 2] - 5[-6 - 1]$$

$$= 6 \times (-1) - 5 \times (-7)$$

$$= -6 + 35 = 29$$

$$\text{R.H.S.} = 3(x - 8) - 5(7x - 6) + 9x$$

$$= 3[-1 - 8] - 5[7 \times (-1) - 6] + 9(-1)$$

$$= 3 \times (-9) - 5[-7 - 6] - 9$$

$$= -27 - 5(-13) - 9$$

$$= -27 + 65 - 9$$

$$= 65 - 36 = 29 .$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = -1$

#### Question 14.

**Solution:**

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

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

$$\Rightarrow t - 2t + 10t - 10 = 8t - 3t + 18$$

$$\Rightarrow 9t - 10 = 5t + 18$$

$$\Rightarrow 9t - 5t = 18 + 10 \text{ (By transposing)}$$

$$\Rightarrow 4t = 28$$

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$$\Rightarrow t = 7$$

Check:

$$\begin{aligned}\text{L.H.S.} &= t - [2t + 5] - 5[1 - 2t] \\ &= 7 - [2 \times 7 + 5] - 5[1 - 2 \times 7] \\ &= 7 - [14 + 5] - 5[1 - 14] \\ &= 7 - 19 - 5(-13) \\ &= 7 - 19 + 65 \\ &= 72 - 19 = 53\end{aligned}$$

$$\begin{aligned}\text{R.H.S.} &= 2[3 + 4t] - 3(t - 4) \\ &= 2(3 + 4 \times 7) - 3(7 - 4) \\ &= 2(3 + 28) - 3(3) \\ &= 2(31) - 9 = 62 - 9 = 53\end{aligned}$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence  $t = 7$  Ans.

### Question 15.

**Solution:**

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

$$\Rightarrow \frac{2}{3}x - \frac{3}{8}x = \frac{7}{12} \quad (\text{By transposing})$$

$$\Rightarrow \frac{16x - 9x}{24} = \frac{7}{12} \quad (\text{LCM of 3, 8 = 24})$$

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

$$\therefore x = 2$$

Check :

$$\text{L.H.S.} = \frac{2}{3}x = \frac{2}{3} \times 2 = \frac{4}{3}$$

$$\text{R.H.S.} = \frac{3}{8}x + \frac{7}{12} = \frac{3}{8} \times 2 + \frac{7}{12} = \frac{3}{4} + \frac{7}{12}$$

$$= \frac{9+7}{12} = \frac{16}{12} = \frac{4}{3}$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = 2$

**Question 16.**

**Solution:**

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$$\frac{21x-7-5x}{35} = \frac{3}{1} \quad (\text{LCM of 5, 7} = 35)$$

$$\frac{16x-7}{35} = \frac{3}{1} \quad (\text{By cross multiplication})$$

$$\Rightarrow 16x - 7 = 3 \times 35 \Rightarrow 16x - 7 = 105$$

$$\Rightarrow 16x = 105 + 7 = 112$$

$$\Rightarrow x = \frac{112}{16} = 7 \Rightarrow x = 7$$

$$\therefore x = 7$$

Check :

$$\text{L.H.S.} = \frac{3x-1}{5} - \frac{x}{7} = \frac{3 \times 7 - 1}{5} = \frac{-7}{7}$$

$$= \frac{21-1}{5} - 1 = \frac{20}{5} - 1 = 4 - 1 = 3 = \text{R.H.S.}$$

Hence  $x = 7$ .

**Question 17.**

**Solution:**

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$$\Rightarrow 20x - 15x = -36 + 30$$

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

$$\therefore x = \frac{-6}{5}$$

Check :

$$\begin{aligned} \text{L.H.S.} &= 2x - 3 = 2 \times \left(\frac{-6}{5}\right) - 3 \\ &= \frac{-12}{5} - \frac{3}{1} = \frac{-12 - 15}{5} = \frac{-27}{5} \end{aligned}$$

$$\begin{aligned} \text{R.H.S.} &= \frac{3}{10}(5x - 12) \\ &= \frac{3}{10} \left[ 5 \times \left(\frac{-6}{5}\right) - 12 \right] \\ &= \frac{3}{10}(-6 - 12) = \frac{3}{10} \times (-18) \\ &= \frac{3 \times (-18)}{10} = \frac{3 \times (-9)}{5} = \frac{-27}{5} \end{aligned}$$

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

$$\text{Hence } x = \frac{-6}{5}$$

$$\begin{aligned} \frac{2x-3}{1} &= \frac{3}{10}(5x-12) \\ \Rightarrow 10(2x-3) &= 3(5x-12) \\ &\quad \text{(By cross multiplication)} \\ \Rightarrow 20x-30 &= 15x-36 \end{aligned}$$

Question 18.

Solution:

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$$\frac{y-1}{3} - \frac{y-2}{4} = 1$$

$$\frac{4(y-1) - 3(y-2)}{12} = 1 \quad (\text{LCM of } 3, 4 = 12)$$

$$\Rightarrow \frac{4y-4-3y+6}{12} = 1$$

$$\Rightarrow \frac{y+2}{12} = 1 \quad \Rightarrow y+2 = 12$$

$$\Rightarrow y = 12 - 2 = 10 \quad \Rightarrow y = 10$$

$$\therefore y = 10$$

Check :

$$\text{L.H.S.} = \frac{y-1}{3} - \frac{y-2}{4}$$

$$= \frac{10-1}{3} - \frac{10-2}{4} = \frac{9}{3} - \frac{8}{4} = 3 - 2 = 1 = \text{R.H.S.}$$

Hence  $y = 10$

**Question 19.**

**Solution:**

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

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

(LCM of 4, 3 = 12)

$$3(x-2) + 4 = 12x - 4(2x-1)$$

$$\Rightarrow 3x - 6 + 4 = 12x - 8x + 4$$

$$\Rightarrow 3x - 12x + 8x = 4 + 6 - 4$$

$$\Rightarrow -12x + 11x = 10 - 4$$

$$\Rightarrow -x = 6 \Rightarrow x = -6$$

$$\therefore x = -6$$

Check :

$$\text{L.H.S.} = \frac{x-2}{4} + \frac{1}{3} = \frac{-6-2}{4} + \frac{1}{3} = \frac{-8}{4} + \frac{1}{3}$$

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

$$\text{R.H.S.} = x - \frac{2x-1}{3}$$

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

$$= -6 - \frac{-12-1}{3} = -6 - \frac{(-13)}{3}$$

$$= -6 + \frac{13}{3} = \frac{-18+13}{3} = \frac{-5}{3}$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

$$\text{Hence } x = -6$$

**Question 20.**

**Solution:**

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

$$= \frac{5(2x-1) - 3(6x-2) = 5}{15}$$

(LCM of 3, 5 = 15)

$$10x - 5 - 18x + 6 = 5$$

$$\Rightarrow -8x + 1 = 5 \Rightarrow -8x = 5 - 1 = 4$$

$$\therefore x = \frac{4}{-8} = \frac{-1}{2}$$

$$\text{Check : L.H.S.} = \frac{2x-1}{3} - \frac{6x-2}{5}$$

$$= \frac{2 \times \left(-\frac{1}{2}\right) - 1}{3} - \frac{6 \times \left(-\frac{1}{2}\right) - 2}{5}$$

$$= \frac{-1-1}{3} - \frac{-3-2}{5} = \frac{-2}{3} - \frac{(-5)}{5}$$

$$= \frac{-2}{3} + 1 = \frac{1}{3} = \text{R.H.S.}$$

$$\text{Hence } x = \frac{-1}{2}$$

**Question 21.**

**Solution:**

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

$$\frac{5(y+7) = 15 + 3(3y-2)}{15} \quad (\text{LCM of 3, 5 = 15})$$

$$5y + 35 = 15 + 9y - 6$$

$$5y - 9y = 15 - 6 - 35 \quad (\text{By transposing})$$

$$-4y = -26$$

$$y = \frac{-26}{-4} = \frac{13}{2}$$

$$\therefore y = \frac{13}{2}$$

Check

$$\text{L.H.S.} = \frac{y+7}{3} = \frac{\frac{13}{2}+7}{3} = \frac{13+14}{2 \times 3}$$

$$= \frac{27}{6} = \frac{9}{2}$$

$$\text{R.H.S.} = 1 + \frac{3y-2}{5} = 1 + \frac{3 \times \frac{13}{2} - 2}{5}$$

$$= 1 + \frac{\frac{39}{2} - 2}{5} = 1 + \frac{39-4}{2 \times 5}$$

$$= 1 + \frac{35}{10} = 1 + \frac{7}{2} = \frac{2+7}{2} = \frac{9}{2}$$

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

$$\text{Hence } y = \frac{13}{2}$$

**Question 22.**

**Solution:**

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$$\frac{2}{7}(x - 9) + \frac{x}{3} = \frac{3}{1}$$

$$\Rightarrow \frac{6(x-9) + 7x = 63}{21} \quad (\text{LCM of 7, 3} = 21)$$

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

$$\Rightarrow 6x + 7x = 63 + 54 = 117$$

$$\Rightarrow 13x = 117$$

$$\Rightarrow x = \frac{117}{13} = 9$$

Check :

$$\text{L.H.S.} = \frac{2}{7}(x - 9) + \frac{x}{3}$$

$$= \frac{2}{7}(9 - 9) + \frac{9}{3} = \frac{2}{7} \times 0 + 3$$

$$= 0 + 3 = 3 = \text{R.H.S.}$$

Hence  $x = 9$

**Question 23.**

**Solution:**

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$$\frac{28(2x-3) + 35(x+3) = 20(4x+1)}{140}$$

140

(LCM of 5, 4, 7 = 140)

$$28(2x-3) + 35(x+3) = 20(4x+1)$$

$$\Rightarrow 56x - 84 + 35x + 105 = 80x + 20$$

$$\Rightarrow 56x + 35x - 80x = 20 + 84 - 105$$

$$\Rightarrow 91x - 80x = 104 - 105$$

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

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

Check :

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

$$\text{L.H.S.} = \frac{2x-3}{5} + \frac{x+3}{4}$$

$$= \frac{2\left(-\frac{1}{11}\right) - 3}{5} + \frac{-\frac{1}{11} + 3}{4} = \frac{-\frac{2}{11} - 3}{5} + \frac{-\frac{1}{11} + 3}{4}$$

$$= \frac{-2 - 33}{11 \times 5} + \frac{-1 + 33}{11 \times 4}$$

$$= \frac{-35}{11 \times 5} + \frac{32}{11 \times 4} = \frac{-7}{11} + \frac{8}{11} = \frac{1}{11}$$

$$\text{R.H.S.} = \frac{4x+1}{7} = \frac{4\left(-\frac{1}{11}\right) + 1}{7} = \frac{-\frac{4}{11} + 1}{7}$$

$$= \frac{-4 + 11}{11 \times 7} = \frac{7}{11 \times 7} = \frac{1}{11}$$

Question 24.

Solution:

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$$\frac{3}{4} (7x - 1) - \left[ 2x - \frac{1-x}{2} \right] = x + \frac{3}{2}$$

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

$$\Rightarrow \frac{21x-3}{4} - \frac{5x-1}{2} = \frac{2x+3}{2}$$

$$= \frac{21x-3-10x+2}{4} = \frac{4x+6}{4}$$

(L.C.M. 4, 2 = 4)

$$\Rightarrow 21x - 10x - 4x = 6 + 3 - 2$$

(By transposing)

$$\Rightarrow 7x = 7$$

$$\Rightarrow x = \frac{7}{7} = 1$$

$$\therefore x = 1$$

Check :

$$\frac{3}{4} (7x - 1) - \left[ 2x - \frac{1-x}{2} \right]$$

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

$$= \frac{3 \times 6}{4} - (2 - 0) = \frac{18}{4} - 2$$

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

$$\text{R.H.S.} = x + \frac{3}{2} = 1 + \frac{3}{2} = \frac{2+3}{2} = \frac{5}{2}$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = 1$

**Question 25.**

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**Solution:**

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

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

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

(LCM of 6, 3, 4, 12 = 12)

$$\Rightarrow 2x + 4 - 44 + 4x + 3 = 3x - 4$$

$$\Rightarrow 2x + 4x - 3x = -4 - 4 + 44 - 3$$

$$\Rightarrow 6x - 3x = 44 - 11$$

$$\Rightarrow 3x = 33$$

$$\Rightarrow x = \frac{33}{3} = 11$$

$$\therefore x = 11$$

**Check :**

$$\text{L.H.S.} = \frac{x+2}{6} - \left[ \frac{11-x}{3} - \frac{1}{4} \right]$$

$$= \frac{11+2}{6} - \left[ \frac{11-11}{3} - \frac{1}{4} \right] = \frac{13}{6} - \left( 0 - \frac{1}{4} \right)$$

$$= \frac{13}{6} + \frac{1}{4} = \frac{26+3}{12} = \frac{29}{12}$$

$$\text{R.H.S.} = \frac{3x-4}{12} = \frac{3 \times 11 - 4}{12} = \frac{33-4}{12} = \frac{29}{12}$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = 11$

**Question 26.**

**Solution:**

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

$$\Rightarrow \frac{9x+7}{2} - \frac{x}{1} + \frac{x-2}{7} = 36$$

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

(LCM of 2, 7 = 14)

$$\Rightarrow 63x + 49 - 14x + 2x - 4 = 504$$

$$\Rightarrow 63x - 14x + 2x = 504 + 4 - 49$$

$$\Rightarrow 65x - 14x = 508 - 49$$

$$\Rightarrow 51x = 459$$

$$\Rightarrow x = \frac{459}{51} = 9$$

$$\therefore x = 9$$

Check :

$$\text{L.H.S.} = \frac{9x+7}{2} - \left(x - \frac{x-2}{7}\right)$$

$$= \frac{9 \times 9 + 7}{2} - \left(9 - \frac{9-2}{7}\right) = \frac{81+7}{2} - \left(9 - \frac{7}{7}\right)$$

$$= \frac{88}{2} - (9 - 1) = 44 - 8 = 36 = \text{R.H.S.}$$

Hence  $x = 9$

**Question 27.**

**Solution:**

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$$\begin{aligned}0.5x + \frac{x}{3} &= 0.25x + 7 \\ \Rightarrow \frac{5}{10}x + \frac{x}{3} &= \frac{25}{100}x + 7 \\ \Rightarrow \frac{1}{2}x + \frac{x}{3} &= \frac{x}{4} + 7 \\ \Rightarrow \frac{1}{2}x + \frac{1}{3}x - \frac{1}{4}x &= 7 \\ \Rightarrow \frac{6x + 4x - 3x}{12} &= 7 \quad \Rightarrow \frac{7x}{12} = 7 \\ \Rightarrow x &= \frac{7 \times 12}{7} = 12 \\ \therefore x &= 12\end{aligned}$$

Check : L.H.S. =  $0.5x + \frac{x}{3}$

$$\begin{aligned}&= \frac{1}{2}x + \frac{x}{3} = \frac{12}{2} + \frac{12}{3} \\ &= 6 + 4 = 10\end{aligned}$$

$$\text{R.H.S.} = 0.25x + 7 = \frac{1}{4} \times 12 + 7 = 3 + 7 = 10$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = 12$

**Question 28.**

**Solution:**

$$0.18(5x - 4) = 0.5x + 0.8$$

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$$\Rightarrow 90x - 72 = 50x + 80$$

$$\Rightarrow 90x - 50x = 80 + 72$$

$$\Rightarrow 40x = 152$$

$$\Rightarrow x = \frac{152}{40} = \frac{38}{10} = 3.8$$

$$\therefore x = 3.8$$

$$\text{Check : L.H.S.} = 0.18(5x - 4)$$

$$= 0.18(5 \times 3.8 - 4) = 0.18(19.0 - 4)$$

$$= 0.18 \times 15 = 2.70 = 2.7$$

$$\text{R.H.S.} = 0.5x + 0.8 = 0.5 \times 3.8 + 0.8$$

$$= 1.90 + 0.8 = 1.9 + 0.8 = 2.7$$

$$\therefore \text{L.H.S.} = \text{R.H.S.}$$

$$\text{Hence } x = 3.8$$

$$\frac{18}{100}(5x - 4) = \frac{5}{10}x + \frac{8}{10}$$
$$\frac{18(5x - 4) = 50x + 80}{100}$$

### Question 29.

#### Solution:

$$2.4(3 - x) - 0.6(2x - 3) = 0$$

$$\Rightarrow 7.2 - 2.4x - 1.2x + 1.8 = 0$$

$$\Rightarrow -2.4x - 1.2x = -(7.2 + 1.8).$$

$$\text{L.H.S.} = 2.4(3 - x) - 0.6(2x - 3)$$

$$\Rightarrow 2.4(3 - 2.5) - 0.6(2 \times 2.5 - 3)$$

$$\Rightarrow 2.4(0.5) - 0.6(5 - 3)$$

$$\Rightarrow 1.2 - 0.6 \times 2 = 1.2 - 1.2 = 0 = \text{R.H.S.}$$

$$\text{Hence } x = 2.5$$

### Question 30.

#### Solution:

$$0.5x - (0.8 - 0.2x) = 0.2 - 0.3x$$

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$$\Rightarrow 0.5x - 0.8 + 0.2x = 0.2 - 0.3x$$

$$\Rightarrow 0.5x + 0.2x + 0.3x = 0.2 + 0.8$$

$$\Rightarrow 1.0x = 1.0$$

$$\Rightarrow x = 1$$

Check :

$$\text{L.H.S.} = 0.5x - (0.8 - 0.2x)$$

$$= 0.5 \times 1 - (0.8 - 0.2 \times 1)$$

$$= 0.5 - (0.8 - 0.2) = 0.5 - 0.6 = -0.1$$

$$\text{R.H.S.} = 0.2 - 0.3x = 0.2 - 0.3 \times 1 = 0.2 - 0.3 = -0.1$$

$$\text{L.H.S.} = \text{R.H.S.}$$

Hence  $x = 1$

### Question 31.

**Solution:**

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

By cross multiplication, we get

$$7(x - 2) = 3(x + 2)$$

$$7x - 14 = 3x + 6$$

$$\Rightarrow 7x - 3x = 6 + 14$$

$$\Rightarrow 4x = 20 \quad \Rightarrow \quad x = \frac{20}{4} = 5$$

$$x = 5$$

Check :

$$\text{L.H.S.} = \frac{x+2}{x-2} = \frac{5+2}{5-2} = \frac{7}{3} = \text{R.H.S.}$$

Hence  $x = 5$

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**Question 32.**

**Solution:**

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

(By cross multiplication)

$$3(3x + 4) = 1(2x + 5)$$

$$9x + 12 = 2x + 5 \Rightarrow 9x - 2x = 5 - 12$$

$$\Rightarrow 7x = -7 \quad \Rightarrow \quad x = \frac{-7}{7} = -1$$

$$x = -1$$

**Check :**

$$\text{L.H.S.} = \frac{2x+5}{3x+4} = \frac{2(-1)+5}{3(-1)+4} = \frac{-2+5}{-3+4}$$

$$= \frac{3}{1} = 3 = \text{R.H.S.}$$

Hence  $x = -1$

**Ex 7B**

**Question 1.**

**Solution:**

Let the required number =  $x$

$$\text{Then } 2x - 7 = 45$$

$$2x = 45 + 7 = 52$$

$$x = 26$$

Required number = 26

**Question 2.**

**Solution:**

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Let the required number = x Then

$$3x + 5 = 44$$

$$\Rightarrow 3x = 44 - 5 = 39$$

$$x = 13$$

Required number = 13

### Question 3.

**Solution:**

Let the required fraction = x

$$\text{then } 2x + 4 = 265$$

$$\Rightarrow 2x = \frac{26}{5} - 4$$

$$\Rightarrow 2x = \frac{26 - 20}{5} = \frac{6}{5}$$

$$\therefore x = \frac{6}{5} \times \frac{1}{2} = \frac{3}{5}$$

$$\therefore \text{Required fraction} = \frac{3}{5}$$

### Question 4.

**Solution:**

Let the required number = x

and half of the number = x/2

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$$\begin{aligned} \text{Then, } \frac{x}{2} + x &= 72 & \Rightarrow \frac{3x}{2} &= 72 \\ \Rightarrow \frac{x+2x}{2} &= 72 & \therefore x &= \frac{72 \times 2}{3} = 24 \times 2 = 48 \\ & & \therefore \text{Required number} &= 48 \end{aligned}$$

**Question 5.****Solution:**

Let the required number = x

Two third of the number =  $2x/3$

$$\begin{aligned} \therefore \frac{2x}{3} + x &= 55 \\ \Rightarrow \frac{2x+3x}{3} &= 55 & \Rightarrow \frac{5x}{3} &= 55 \\ \Rightarrow x &= \frac{55 \times 3}{5} = 33 \\ \therefore \text{Required number} &= 33 \end{aligned}$$

**Question 6.****Solution:**

Let the required number = x

Then,  $4x = x + 45$

$$\Rightarrow 4x - x = 45$$

$$\Rightarrow 3x = 45$$

$$\Rightarrow x = 15$$

Required number = 15

**Question 7.**

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**Solution:**

Let the required number =  $x$

Then  $x - 21 = 71 - x$

$$\Rightarrow x + x = 71 + 21$$

$$\Rightarrow 2x = 92$$

$$\Rightarrow x = 46$$

**Question 8.****Solution:**

Let the original number =  $x$

Then 23 of the number =  $23x$

$$\text{Then } x - \frac{2}{3}x = 20$$

$$\Rightarrow \frac{3x - 2x}{3} = 20$$

$$\Rightarrow \frac{x}{3} = 20 \quad \Rightarrow x = 20 \times 3 = 60$$

$\therefore$  Original number = 60

**Question 9.****Solution:**

Let the second number =  $x$

then first number =  $25x$

their sum = 70

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$$\therefore x + \frac{2}{5}x = 70$$

$$\Rightarrow \frac{5x+2x}{5} = 70$$

$$\Rightarrow \frac{7x}{5} = 70 \Rightarrow x = \frac{70 \times 5}{7} = 50$$

$\therefore$  Second number = 50

$$\text{and first number} = \frac{2}{5} \times 50 = 20$$

$\therefore$  Numbers are 20, 50

**Question 10.**

**Solution:**

Let the required number = x

$$\text{Two-third of the number} = \frac{2}{3}x$$

$$\text{and one third of the number} = \frac{1}{3}x$$

$$\text{then } \frac{2}{3}x - \frac{1}{3}x = 3$$

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

$$\Rightarrow \frac{1}{3}x = 3 \Rightarrow x = \frac{3 \times 3}{1} = 9$$

$\therefore$  Required number = 9

**Question 11.**

**Solution:**

Let the required number = x

Fifth part of the number = x5

Fourth part of the number = x4

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$$\therefore \frac{x}{5} + 5 = \frac{x}{4} - 5$$

$$\Rightarrow \frac{x}{5} - \frac{x}{4} = -5 - 5$$

$$\Rightarrow \frac{4x - 5x}{20} = -10 \Rightarrow \frac{-x}{20} = -10$$

$$\Rightarrow \frac{x}{20} = 10 \Rightarrow x = 10 \times 20 = 200$$

$\therefore$  Required number = 200

### Question 12.

#### Solution:

Let first natural number =  $x$  then

next number =  $x + 1$

$$x + x + 1 = 63$$

$$\Rightarrow 2x = 63 - 1 = 62$$

$$x = 31$$

first number = 31

and second number =  $31 + 1 = 32$

Numbers are 31, 32

### Question 13.

#### Solution:

Let first odd number =  $2x + 1$

second odd number =  $2x + 3$

$$2x + 1 + 2x + 3 = 76$$

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$$\Rightarrow 4x + 4 = 76$$

$$\Rightarrow 4x = 76 - 4 = 72$$

$$x = 18$$

$$\text{First number} = 2x + 1 = 2 \times 18 + 1 = 36 + 1 = 37$$

$$\text{Second number} = 2x + 3 = 2 \times 18 + 3 = 36 + 3 = 39$$

Numbers are 37, 39

#### **Question 14.**

##### **Solution:**

$$\text{Let first positive even number} = 2x$$

$$\text{Second number} = 2x + 2$$

$$\text{Third number} = 2x + 4$$

$$2x + 2x + 2 + 2x + 4 = 90$$

$$\Rightarrow 6x + 6 = 90$$

$$\Rightarrow 6x = 90 - 6 = 84$$

$$x = 14$$

$$\text{First even number} = 2x = 2 \times 14 = 28$$

$$\text{Second number} = 2x + 2 = 2 \times 14 + 2 = 28 + 2 = 30$$

$$\text{Third number} = 30 + 2 = 32$$

Required numbers are 28, 30, 32

#### **Question 15.**

##### **Solution:**

$$\text{Sum of two numbers} = 184$$

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Let first number =  $x$

Then second number =  $184 - x$

$$\text{Then } x \times \frac{1}{3} = (184 - x) \times \frac{1}{7} + 8$$

$$\frac{x}{3} = \frac{184 - x}{7} + 8$$

$$\frac{7x = 3(184 - x) + 168}{21} \quad (\text{L.C.M. of 3, 7 = 21})$$

$$7x = 552 - 3x + 168$$

$$\Rightarrow 7x + 3x = 552 + 168$$

$$\Rightarrow 10x = 720 \quad \Rightarrow x = \frac{720}{10} = 72$$

First part = 72

Second part =  $184 - 72 = 112$

Hence parts are 72, 112

### Question 16.

#### Solution:

Total number of notes = 90

Let number of notes of Rs. 5 =  $x$

Then number of notes of Rs.10 =  $90 - x$

Then  $x \times 5 + (90 - x) \times 10 = 500$

$$\Rightarrow 5x + 900 - 10x = 500$$

$$\Rightarrow -5x = 500 - 900 = -400$$

$$x = 8$$

Number of 5 rupees notes = 80

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and ten rupees notes =  $90 - 80 = 10$

**Question 17.**

**Solution:**

Amount of coins = Rs. 34

Let 50 paisa coins =  $x$

then 25 paisa coins =  $2x$

$$\text{then } \frac{x \times 50}{100} + \frac{2x \times 25}{100} = 34$$

$$\Rightarrow \frac{x}{2} + \frac{x}{2} = 34 \quad \Rightarrow \quad \frac{2x}{2} = 34$$

$$\Rightarrow x = 34$$

Number of 50 paisa coins = 34

and number of 25 paisa coins =  $2x = 2 \times 34 = 68$

**Question 18.**

**Solution:**

Let present age of Raju's cousin =  $x$  years

then age of Raju =  $(x - 19)$  years

After 5 years,

Raju's age =  $x - 19 + 5 = (x - 14)$  years

and his cousin age =  $x + 5$

$$(x - 14) : (x + 5) = 2 : 3$$

$$\Rightarrow x - 14x + 5 = 23$$

$$\Rightarrow 3(x - 14) = 2(x + 5) \text{ (By cross multiplication)}$$

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$$\Rightarrow 3x - 42 = 2x + 10$$

$$\Rightarrow 3x - 2x = 10 + 42$$

$$\Rightarrow x = 52$$

Raju's age =  $x - 19 = 52 - 19 = 33$  years

and his cousin age = 52 years.

### Question 19.

#### Solution:

Let present age of son =  $x$  years

Age of father =  $(x + 30)$  years

12 years after,

Father's age =  $x + 30 + 12 = (x + 42)$  years

and son's age =  $(x + 12)$  years

$$(x + 42) = 3(x + 12)$$

$$\Rightarrow x + 42 = 3x + 36$$

$$\Rightarrow 3x + 36 = x + 42$$

$$\Rightarrow 3x - x = 42 - 36$$

$$\Rightarrow 2x = 6$$

$$\Rightarrow x = 3$$

Son's age = 3 years

Father's age =  $3 + 30 = 33$  years

### Question 20.

#### Solution:

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Ratio in present ages of Sonal and Manoj = 7 : 5

Let Sonal's age =  $7x$

then Manoj's age =  $5x$

10 years hence,

Sonal's age will be =  $7x + 10$

and Manoj's age =  $5x + 10$

$$\therefore \frac{7x+10}{5x+10} = \frac{9}{7}$$

(By cross multiplications)

$$7(7x + 10) = 9(5x + 10)$$

$$\Rightarrow 49x + 70 = 45x + 90$$

$$\Rightarrow 49x - 45x = 90 - 70$$

$$\Rightarrow 4x = 20 \quad \Rightarrow x = \frac{20}{4} = 5$$

Sonal's present age =  $7x = 7 \times 5 = 35$  years

and Manoj's age =  $5x = 5 \times 5 = 25$  years

### Question 21.

#### Solution:

Five years ago,

Let Son's age =  $x$  years

and father's age =  $7x$  years

Present age of son =  $(x + 5)$  years

and age of father =  $(7x + 5)$  years

5 years hence,

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$$\text{father's age} = 7x + 5 + 5 = 7x + 10$$

$$\text{and Son's age} = x + 5 + 5 = x + 10$$

$$(7x + 10) = 3(x + 10)$$

$$\Rightarrow 7x + 10 = 3x + 30$$

$$\Rightarrow 7x - 3x = 30 - 10$$

$$\Rightarrow 4x = 20$$

$$\Rightarrow x = 5$$

$$\text{Father present age} = 7x + 5 = 7 \times 5 + 5 = 35 + 5 = 40 \text{ years}$$

$$\text{and son's age} = x + 5 = 5 + 5 = 10 \text{ years}$$

### Question 22.

#### Solution:

Let age of Manoj 4 years ago =  $x$

then his present age =  $x + 4$

After 12 years his age will be =  $x + 4 + 12 = x + 16$

$$x + 16 = 3(x)$$

$$x + 16 = 3x$$

$$\Rightarrow 16 = 3x - x$$

$$\Rightarrow 2x = 16$$

$$x = 8$$

His present age =  $8 + 4 = 12$  years

### Question 23.

#### Solution:

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Let total marks =  $x$

Pass marks = 40% of  $x = 40 \times 100 = 25x$

No. of marks got by Rupa = 185

No. of marks by which she failed = 15

Pass marks =  $185 + 15 = 200$

$25x = 200$

$\Rightarrow x = 200 \times 52x$

$\Rightarrow x = 500$

Hence total marks = 500

#### **Question 24.**

#### **Solution:**

Sum of digits = 8

Let units digit =  $x$

Then tens digit =  $8 - x$

and number will be  $x + 10(8 - x) \dots(i)$

By adding 18, the digits are reversed then

units digit =  $8 - x$

and tens digit =  $x$

Number =  $(8 - x) + 10x$

According to the condition,

$(8 - x) + 10x = 18 + x + 10(8 - x)$

$\Rightarrow 8 - x + 10x = 18 + x + 80 - 10x$

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$$\Rightarrow 10x - x - x + 10x = 18 + 80 - 8$$

$$\Rightarrow 18x = 90$$

$$\Rightarrow x = 5$$

Number is

$$x + 10(8 - x) = 5 + 10(8 - 5) = 5 + 10 \times 3 = 35$$

**Question 25.**

**Solution:**

Cost of 3 tables and 2 chairs = 1850

Cost of table = Rs. 75 + cost of a chair

Let cost of chair = Rs.  $x$ ,

then Cost of table = Rs.  $75 + x$

According to the condition,

$$3(75 + x) + 2x = 1850$$

$$\Rightarrow 225 + 3x + 2x = 1850$$

$$\Rightarrow 225 + 5x = 1850$$

$$\Rightarrow 5x = 1850 - 225 = 1625$$

$$x = 325$$

Cost of chair = Rs. 325

and cost of table = Rs.  $325 + 75 =$  Rs. 400

**Question 26.**

**Solution:**

S.P of article = Rs. 495

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gain = 10%

Let cost price = Rs.  $x$

$$\therefore \text{S.P.} = \frac{x \times (100 + 10)}{100} = \frac{110}{100}x$$

$$\therefore \frac{110}{100}x = 495$$

$$\Rightarrow x = \frac{495 \times 100}{110} = 45 \times 10 = 450$$

$\therefore$  Cost price = Rs. 450

### Question 27.

**Solution:**

Perimeter of field = 150 m

Length + Breadth =  $150 \div 2 = 75$  m

[Perimeter =  $2(l + b)$ ]

Let length =  $x$  Then breadth =  $75 - x$

Then  $x = 2(75 - x)$

$$\Rightarrow x = 150 - 2x$$

$$\Rightarrow x + 2x = 150$$

$$\Rightarrow 3x = 150$$

$$\Rightarrow x = 150 \div 3 = 50$$

Length = 50 m

and breadth =  $75 - 50 = 25$  m

### Question 28.

**Solution:**

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Perimeter of an isosceles triangle = 55 m

Let the third side of an isosceles triangle =  $x$

Then each equal side =  $(2x - 5)$  m

According to the condition,

$$x + 2(2x - 5) = 55$$

$$\Rightarrow x + 4x - 10 = 55$$

$$\Rightarrow 5x = 55 + 10$$

$$\Rightarrow 5x = 65$$

$$\Rightarrow x = 13$$

$$\text{and } 2x - 5 = 2 \times 13 - 5 = 21 \text{ m}$$

Sides will be 13m, 21m, 21m

### Question 29.

#### Solution:

Sum of two complementary angles =  $90^\circ$

Let first angle =  $x$

then second =  $90^\circ - x$

$$x - (90 - x) = 8$$

$$\Rightarrow x - 90 + x = 8$$

$$\Rightarrow 2x = 8 + 90$$

$$\Rightarrow 2x = 98$$

$$\Rightarrow x = 49$$

first angle =  $49^\circ$

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and second angle =  $90^\circ - 49^\circ = 41^\circ$

Hence angles are  $41^\circ, 49^\circ$

**Question 30.**

**Solution:**

Sum of two supplementary angles =  $180^\circ$

Let first angle =  $x$

Then second angle =  $180^\circ - x$

$$x - (180^\circ - x) = 44^\circ$$

$$\Rightarrow x - 180^\circ + x = 44^\circ$$

$$\Rightarrow 2x = 44^\circ + 180^\circ = 224^\circ$$

$$\Rightarrow 2x = 224^\circ$$

$$\Rightarrow x = 112^\circ$$

First angle =  $112^\circ$

and second angle =  $180^\circ - 112^\circ = 68^\circ$

Hence angles are  $68^\circ, 112^\circ$

**Question 31.**

**Solution:**

In an isosceles triangle

Let each equal base angles =  $x$

Then vertex angle =  $2x$

According to the condition,

$$x + x + 2x = 180^\circ \text{ (sum of angles of a triangle)}$$

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$$\Rightarrow 4x = 180^\circ$$

$$\Rightarrow x = 45^\circ$$

$$\text{Then vertex angle} = 2x = 2 \times 45^\circ = 90^\circ$$

Angles of the triangle are  $45^\circ$ ,  $45^\circ$  and  $90^\circ$

**Question 32.**

**Solution:**

Let length of total journey =  $x$  km

According to the condition,

$$\Rightarrow 39x + 80 = 40x$$

$$\Rightarrow 40x - 39x = 80$$

$$\Rightarrow x = 80$$

Total journey = 80km

**Question 33.**

**Solution:**

No. of days = 20 Let no. of days he worked =  $x$

Then he will receive amount =  $x \times \text{Rs. } 120 = \text{Rs. } 120x$

No. of days he did not work =  $20 - x$

Fine paid =  $(20 - x) \times \text{Rs. } 10 = \text{Rs. } 10(20 - x)$

$$120x - 10(20 - x) = 1880$$

$$\Rightarrow 120x - 200 + 10x = 1880$$

$$\Rightarrow 130x = 1880 + 200 = 2080$$

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$$x = 16$$

No. of days he remained absent =  $20 - x = 20 - 16 = 4$  days

**Question 34.**

**Solution:**

Let value of property =  $x$

$$\text{Then son's share} = x \times \frac{1}{3} = \frac{x}{3}$$

$$\text{Daughter's share} = x \times \frac{1}{4} = \frac{x}{4}$$

$$\text{Remaining to wife} = x - \left( \frac{x}{3} + \frac{x}{4} \right)$$

$$\therefore x - \left( \frac{x}{3} + \frac{x}{4} \right) = 18000$$

$$\Rightarrow \frac{12x - (4x + 3x)}{12} = 18000$$

$$\frac{12x - 7x}{12} = 18000$$

$$\Rightarrow \frac{5x}{12} = 18000$$

$$\therefore x = 18000 \times \frac{12}{5} = 3600 \times 12$$

$$= 43200$$

$$\therefore \text{Value of property} = \text{Rs. } 43200$$

**Question 35.**

**Solution:**

Solution = 400 mL

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Quantity of alcohol = 15% of 400 mL

$$= 400 \times 15\% = 60 \text{ mL}$$

Let pure alcohol added =  $x$  mL

$$\text{Total solution} = 400 + x$$

$$\text{and total alcohol} = (x + 60)$$

$$\text{Now } (400 + x) \times 32\% = x + 60$$

$$\Rightarrow (400 + x) \times 32\% = x + 60$$

$$\Rightarrow 32(400 + x) = 100(x + 60)$$

$$\Rightarrow 12800 + 32x = 100x + 6000$$

$$\Rightarrow 12800 - 6000 = 100x - 32x$$

$$\Rightarrow 6800 = 68x$$

$$\Rightarrow x = 100$$

Pure alcohol added = 100 mL

### Ex 7C

#### Objective Questions :

Mark (✓) against the correct answer in each of the following :

Question 1.

Solution:

(d)

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

$$\Rightarrow 3x = \frac{-8+9}{12} \Rightarrow 3x = \frac{1}{12}$$

$$\Rightarrow x = \frac{1}{12 \times 3} = \frac{1}{36}$$

**Question 2.****Solution:**

(d)

$$\Rightarrow 2z - \frac{1}{4}z = 5 - \frac{8}{3}$$

$$\Rightarrow \frac{8z - z}{4} = \frac{15 - 8}{3} \Rightarrow \frac{7}{4}z = \frac{7}{3}$$

$$2z + \frac{8}{3} = \frac{1}{4}z + 5$$

$$\Rightarrow z = \frac{7}{3} \times \frac{4}{7} = \frac{4}{3}$$

**Question 3.****Solution:**

(a)

$$2n + 5 = 3(3n - 10)$$

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

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

$$\Rightarrow 7n = 35$$

$$\Rightarrow n = 5$$

**Question 4.**

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**Solution:**

(c)

$$\begin{aligned}\frac{x-1}{x+1} &= \frac{7}{9} \Rightarrow 9x - 9 = 7x + 7 \\ \Rightarrow 9x - 7x &= 7 + 9 \\ \Rightarrow 2x &= 16 \quad \Rightarrow x = \frac{16}{2} = 8\end{aligned}$$

**Question 5.**

**Solution:**

(c)

$$\begin{aligned}8(2x - 5) - 6(3x - 7) &= 1 \\ \Rightarrow 16x - 40 - 18x + 42 &= 1 \\ \Rightarrow -2x + 2 &= 1 \\ \Rightarrow -2x &= 1 - 2 = -1\end{aligned}$$

$$x = 12$$

**Question 6.**

**Solution:**

(d)

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$$\begin{aligned}\frac{x}{2} - 1 &= \frac{x}{3} + 4 \\ \Rightarrow \frac{x}{2} - \frac{x}{3} &= 4 + 1 \\ \Rightarrow \frac{3x - 2x}{6} &= 5 \\ \Rightarrow \frac{x}{6} = 5 &\Rightarrow x = 5 \times 6 = 30 \\ \therefore x &= 30\end{aligned}$$

**Question 7.**

**Solution:**

(a)

$$\begin{aligned}\frac{2x-1}{3} &= \frac{x-2}{3} + 1 \\ \Rightarrow \frac{2x-1}{3} &= \frac{x-2+3}{3} \\ \Rightarrow 2x-x &= -2+3+1 \\ \Rightarrow x &= 2 \\ \therefore x &= 2\end{aligned}$$

**Question 8.**

**Solution:**

(b)

Let first whole number =  $x$

Then second number =  $x + 1$

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and sum = 53

$$x + x + 1 = 53$$

$$\Rightarrow 2x = 53 - 1$$

$$\Rightarrow 2x = 52$$

$$\Rightarrow x = 26$$

Smaller number = 26

### Question 9.

#### Solution:

Let first even number =  $2x$

Then second number =  $2x + 2$

and sum = 86

$$2x + 2x + 2 = 86$$

$$\Rightarrow 4x = 86 - 2 = 84$$

$$\Rightarrow x = 21$$

Larger even number =  $2x + 2 = 2 \times 21 + 2 = 42 + 2 = 44$

### Question 10.

#### Solution:

(b)

Let first odd number =  $2x + 1$

Second number =  $2x + 3$

$$2x + 1 + 2x + 3 = 36$$

$$\Rightarrow 4x + 4 = 36$$

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$$\Rightarrow 4x = 36 - 4 = 32$$

$$\Rightarrow x = 8$$

$$\text{Smaller number} = 2x + 1 = 2 \times 8 + 1 = 16 + 1 = 17$$

**Question 11.****Solution:**

(d)

Let number =  $x$

$$2x + 9 = 31$$

$$\Rightarrow 2x = 31 - 9 = 22$$

$$\Rightarrow x = 11$$

**Question 12.****Solution:**

(a)

Let number =  $x$  then

$$3x + 6 = 24$$

$$\Rightarrow 3x = 24 - 6 = 18$$

$$\Rightarrow x = 6$$

Number = 6

**Question 13.****Solution:**

(a)

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$$\therefore \frac{2}{3}x = x - 10$$

$$\Rightarrow x - \frac{2}{3}x = 10$$

$$\Rightarrow \frac{1}{3}x = 10 \Rightarrow x = 30$$

**Question 14.****Solution:**

(b)

Let first angle =  $x$

Then second =  $90^\circ - x$

$$x - (90^\circ - x) = 10$$

$$\Rightarrow x - 90^\circ + x = 10^\circ$$

$$\Rightarrow 2x = 10^\circ + 90^\circ = 100^\circ$$

$$x = 50^\circ$$

$$\text{Second angle} = 90^\circ - 50^\circ = 40^\circ$$

$$\text{Larger angle} = 50^\circ$$

**Question 15.****Solution:**

(b)

Let first angle =  $x$

Then second =  $180^\circ - x$

$$x - (180^\circ - x) = 20^\circ$$

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$$\Rightarrow x - 180^\circ + x = 20^\circ$$

$$\Rightarrow 2x = 20^\circ + 180^\circ = 200^\circ$$

$$x = 100^\circ$$

$$\text{Second angle} = 180^\circ - 100^\circ = 80^\circ$$

$$\text{Smaller angle} = 80^\circ$$

**Question 16.****Solution:**

(c)

Let age of A =  $5x$

Then age of B =  $3x$

After 6 years,

$$\text{A's age} = 5x + 6$$

$$\text{and B's age} = 3x + 6$$

$$5x + 3x + 6 = 75$$

$$\Rightarrow 25x + 30 = 21x + 42$$

$$\Rightarrow 25x - 21x = 42 - 30$$

$$\Rightarrow 4x = 12$$

$$\Rightarrow x = 3$$

$$\text{A's age} = 5x = 5 \times 3 = 15 \text{ years}$$

**Question 17.****Solution:**

(b)

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Let the number =  $x$

According to the condition,

$$5x = 80 + x$$

$$\Rightarrow 5x - x = 80$$

$$\Rightarrow 4x = 80$$

$$\Rightarrow x = 20$$

Number = 20

**Question 18.**

**Solution:**

(c)

Let width of rectangle =  $x$  m

Then length =  $3x$  m

Perimeter = 96 m

$$2(x + 3x) = 96$$

$$\Rightarrow x + 3x = 96 \div 2 = 48$$

$$\Rightarrow 4x = 48$$

$$\Rightarrow x = 12$$

Length =  $3x = 12 \times 3 = 36$  m



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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

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