



**SpeedLabs**

**MATHS**

**ICSE 8<sup>th</sup>**

**TEEVRA EDUTECH PVT. LTD.**

1. Solve the following equations:

(i)  $4x - 9 = 2x + 7$

Ans.  $4x - 9 = 2x + 7$

Or  $4x - 2x = 7 + 9$

Or  $2x = 16$

Or  $x = 8$

(ii)  $3(x - 7) - 2(3x - 4) = (2 - 5x)$

Ans.  $3(x - 7) - 2(3x - 4) = (2 - 5x)$

Or  $3x - 21 - 6x + 8 = 2 - 5x$

Or  $-3x - 13 = 2 - 5x$

Or  $2x = 15$

Or  $x = 7.5$

(iii)  $\frac{(x+5)}{6} - \frac{(x+1)}{9} = \frac{(x+3)}{4}$

Ans.  $\frac{(x+5)}{6} - \frac{(x+1)}{9} = \frac{(x+3)}{4}$

Or  $6(x+5) - 4(x+1) = 9(x+3)$

Or  $6x + 30 - 4x - 4 = 9x + 27$

Or  $2x + 26 = 9x + 27$

Or  $7x = -1$

Or  $x = -\frac{1}{7}$

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

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

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

Or  $\frac{6x+3+8x-4}{4x^2-1} = \frac{7}{2x}$

$$\text{Or } 12x^2 + 6x + 16x^2 - 8x = 28x^2 - 7$$

$$\text{Or } -2x = -7$$

$$\text{Or } x = \frac{7}{2}$$

$$(v) \quad \frac{x+6}{4} - \frac{5x-4}{8} + \frac{x-3}{5} = 0$$

$$\text{Ans.} \quad \frac{x+6}{4} - \frac{5x-4}{8} + \frac{x-3}{5} = 0$$

$$\text{Or } 10(x+6) - 5(5x-4) + 8(x-3) = 0$$

$$\text{Or } 10x + 60 - 25x + 20 + 8x - 24 = 0$$

$$\text{Or } 7x = 56$$

$$\text{Or } x = 8$$

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

$$\text{Ans.} \quad \frac{3}{4}(7x-1) - (2x - \frac{1-x}{2}) = x + \frac{3}{2}$$

$$\text{Or } 3(7x-1) - (8x-2+2x) = 4x+6$$

$$\text{Or } 21x-3-8x+2-2x = 4x+6$$

$$\text{Or } 11x-1 = 4x+6$$

$$\text{Or } 7x = 7$$

$$\text{Or } x = 1$$

2. 17 less than four times a number is 11. Find the number.

Ans. Let the number = x

$$4x - 17 = 11$$

$$x = \frac{28}{4} = 7$$

3. A number is 25 more than its part. Find the number.

Ans. Let the number = x

$$x = 25 + \frac{5}{6}x$$

$$\frac{1}{6}x = 25$$

$$x = 150$$

4. 6 more than one-fourth of the number is two-fifth of the number. Find the number.

**Ans.** Let the number = x

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

$$6 = \left(\frac{2}{5} - \frac{1}{4}\right)x = \frac{30}{20}x$$

$$x = 40$$

5. Two numbers are in the ratio 3:4 and their sum is 84. Find the number.

**Ans.** Let the two numbers be x and y

Therefore

$$3x = 4y$$

$$x + y = 84$$

Solving

$$\frac{4}{3}y + y = 84$$

$$\frac{7y}{3} = 84$$

$$y = 3 \times 12 = 36$$

$$\text{Hence, } x = \frac{4}{3} \times 36 = 48$$

6. Three numbers are in ratio 4 : 5 : 6 and their sum is 135. Find the numbers.

**Ans.** Let the three numbers be x, y, z

Therefore,

$$4x : 5x : 6x$$

$$4x + 5x + 6x = 135$$

Solving

$$15x = 135$$

$$x = 9$$

Therefore

The three numbers are 36, 45, 54

7. Two numbers are in the ratio 3:5. If each is increased by 10, then ratio between the new numbers so formed is 5:7, Find the original numbers.

**Ans.** Let the two numbers be x and y

Given,

$$\frac{x}{y} = \frac{3}{5} \quad \dots\dots\dots\text{i)}$$

$$\frac{x+10}{y+10} = \frac{5}{7} \quad \dots\dots\dots\text{ii)}$$

Solving from (i)

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

Substituting in (ii)

$$\frac{\frac{3}{5}y + 10}{y + 10} = \frac{5}{7}$$

$$\frac{21}{5}y + 70 = 5y + 50$$

$$20 = \frac{4}{5}y$$

$$y = 25$$

$$x = \frac{3}{5} \times 25 = 15$$

Two numbers are 15 and 25.

8. The denominator of the fraction is 4 more than its numerator. On subtracting 1 from each numerator and denominator the fraction becomes  $\frac{1}{2}$ . Find the original fraction.

**Ans.** Let the fraction be  $\frac{x}{y}$

$$\text{Given } y = x + 4$$

$$\text{Therefore, the fraction} = \frac{x}{x+4}$$

$$\text{Given, } \frac{x-1}{x+4-1} = \frac{1}{2}$$

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

$$x = 5 \text{ and } y = 9$$

$$\text{Therefore fraction} = \frac{5}{9}$$

9. The sum of the digits of a two-digit number is 5. On adding 27 to the number, its digits are reversed. Find the original number.

**Ans.** Let the two-digit number be  $xy$

Given

$$x + y = 5 \quad \dots\dots\dots (i)$$

$$xy + 27 = yx$$

$$10x + y + 27 = 10y + x$$

$$9x + 27 = 9y$$

$$\text{Or } x + 3 = y \quad \dots\dots\dots(ii)$$

Solving (i) and (ii) together.

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

$$2x = 2$$

$$x = 1$$

$$y = 4$$

Hence the number = 14

10. The lengths of a rectangle plot of land exceeds its breadth by 23 m if the length is decreased by 15 m. and the breadth is increased by 7 m. the area is reduced by  $360 \text{ m}^2$ .

**Ans.** Find the length and the breadth of the plot.

Let the length =  $l$  and breadth =  $b$

$$l = 23 + b$$

Given

$$(l - 15)(b + 7) = lb - 360$$

$$(23 + b - 15)(b + 7) = (23 + b)b - 360$$

$$(b + 8)(b + 7) = 23b + b^2 - 360$$

$$b^2 + 15b + 56 = 23b + b^2 - 360$$

$$416 = 8b$$

$$\text{Or } b = 52\text{m}$$

Therefore

$$l = b + 23 = 52 + 23 = 75\text{m}$$

11. A man is twice as old as his son. Twelve years ago, the man was thrice as old as his son. Find their present ages.

**Ans.** Let the son's age =  $x$

Man's age =  $2x$

12 years ago

Son's age =  $x - 12$

Man's age =  $2x - 12$

$$2x - 12 = 3(x - 12)$$

$$2x - 12 = 3x - 36$$

$$x = 24 = \text{Son's age}$$

Man's age = 48 years

12. 5 years ago, the age of Parvati was 4 times the age of her son. The sum of their present ages is 55 years. Find Parvati's age.

Ans. Let the present age of Parvati =  $x$  yrs.

age of son =  $y$  yrs.

$$x + y = 55 \quad \dots\dots (i)$$

Five years before

Parvati =  $x - 5$  yrs.

son =  $y - 5$  yrs.

Given,

$$(x - 5) = 4(y - 5)$$

$$x - 4y = -15 \quad \dots\dots(ii)$$

solving (i) and (ii)

$$x - 4(55 - x) = -15$$

$$5x = 205$$

or  $x = 44 = \text{Parvati's age}$

Son's age =  $55 - 44 = 11$  years

13. The distance between two stations is 300 km. two motor-cyclist start simultaneously from these stations and move towards each other. The speed of one of them is 7 km/hr faster than that of other. If the distance between them after 2 hours is 34 km, find the speed of each motor-cycle

Ans. Distance = 300 km

Let the speed of 1<sup>st</sup> cyclist =  $x$

Then speed of 2<sup>nd</sup> cyclist =  $x + 7$

Distance covered by 1<sup>st</sup> cyclist in 2hr =  $2x$

Distance covered by 2<sup>nd</sup> cyclist in 2 hr =  $2(x + 7)$

Therefore

$$2x + 34 + 2(x + 7) = 300$$

$$4x + 48 = 300$$

$$x = \frac{252}{4} = 63 \text{ km/hr}$$

Speed of 1st cyclist = 63 km/hr

Speed of 2nd cyclist =  $63 + 7 = 70$  km/hr

- 14.** A certain number man can finish a piece of work in 50 days. If there are 7 more men, the work can be completed 10 days earlier. How many men were originally there?

**Ans.** Let x men finish work in 50 days

Total work = 50x man days

x + 7 men finish work in 40 days

Total work =  $(x + 7) \times 40$

Therefore

$$50x = 40(x + 7)$$

$$5x = 4x + 28$$

$$x = 28$$

Original no of men = 28

- 15.** A workman is paid Rs. 150 for each day he works and is fined Rs. 50 for each day he is absent. In a month of 30 days he earned Rs. 2100. For how many days did he remain absent?

**Ans.** Salary = 150 Rs. /day

Fine = 50 Rs. /day

Let x be the number of days worked

Therefore

$$150x - (30 - x)50 = 2100$$

Or x = 18 days.