

DAY 9

1. Meena went to a bank to withdraw ₹ 2000. She asked the cashier to give her ₹50 and ₹ 100 notes only. Meena got 25 notes in all. Find how many notes of ₹50 and ₹100 she received. [Ex 3.4, Q 2(iv)]

Sol : Given: **Total amount in ₹50 and ₹100 notes = ₹ 2000**  
and **Total notes of ₹50 and ₹100 notes = 25**

Let the number of notes of ₹ 50 be  $x$  and the number of notes of ₹100 be  $y$

**First Equation:**  $50x + 100y = 2000 \Rightarrow x + 2y = 40 \dots \dots \dots$  i) {divide both sides by 50}

**Second Equation:**  $x + y = 25 \dots \dots \dots$  ii)

Subtract equation ii) from i), we get

$$(x + 2y) - (x + y) = 40 - 25 \Rightarrow y = 15 \quad \text{Replace value of } y \text{ in ii)}$$

$$\text{ii)} \Rightarrow x + 15 = 25 \Rightarrow x = 25 - 15 = 10$$

Meena have 10 notes of ₹50 and 15 notes of ₹100

2. Yash scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each wrong answer, then Yash would have scored 50 marks. How many questions are there in the test?

Sol:- Given **3(each right answer) - 1(wrong answer) = 40**  
and **4(each right answer) - 2(wrong answer) = 50**

{As marks of wrong answers will be deducted}

Let number of right answers be  $x$  and number of wrong answers be  $y$ .

**First Equation:**  $3x - y = 40 \dots \dots \dots$  i)

**Second Equation:**  $4x - 2y = 50$  or  $2x - y = 25 \dots \dots \dots$  ii) {Divide both sides by 2}

Subtract equation ii) from i), we get

$$(3x - y) - (2x - y) = 40 - 25 \Rightarrow x = 15 \quad \text{Replace value of } x \text{ in ii)}$$

$$\text{ii)} \Rightarrow 2(15) - y = 25 \Rightarrow y = 30 - 25 = 5$$

Hence total questions =  $15 + 5 = 20$

3. If in a rectangle the length is decreased by 5 units and breadth is increased by 3 units, the area is reduced by 9 sq. units. If the length is increased by 3 units and breadth is increased by 2 units, the area increases by 67 sq. units. Find length & breadth of rectangle. [Ex 3.5, Q 4(v)]

Sol:- Given **(length - 5)(breadth + 3) = Area - 9**  
and **(length + 3)(breadth + 2) = Area + 67**

Let the length of rectangle =  $x$  units and breadth of rectangle =  $y$  units

$\therefore$  Area of rectangle =  $xy$  sq. meters.

$$\begin{aligned} \text{First Equation} \quad (x - 5)(y + 3) &= xy - 9 \Rightarrow xy - 5y + 3x - 15 = xy - 9 \\ &\Rightarrow 3x - 5y = -9 + 15 = 6 \dots \dots \dots \text{i)} \end{aligned}$$

$$\text{Second Equation} \quad (x + 3)(y + 2) = xy + 67 \Rightarrow xy + 3y + 2x + 6 = xy + 67$$

$$\Rightarrow 2x + 3y = 67 - 6 = 61 \dots\dots\dots \text{ii)}$$

Multiply i) by 2 and ii) by 3 and subtract, we get

$$2(3x - 5y) - 3(2x + 3y) = 2 \times 6 - 3 \times 61$$

$$\Rightarrow 6x - 10y - 6x - 9y = 12 - 183 \Rightarrow -19y = -171$$

$$\Rightarrow y = \frac{-171}{-19} = 9 \quad \text{Replace value of } y \text{ in i), we get}$$

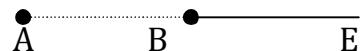
$$\text{i)} \Rightarrow 3x - 5(9) = 6 \Rightarrow 3x = 6 + 45 = 51 \Rightarrow x = \frac{51}{3} = 17$$

$\therefore$  Length of rectangle be 17 units & breadth of rectangle be 9 units.

4. Points A & B are 100 km apart on a highway. One car starts from A & another from B at the same time. If the car travel in the same direction at a constant speed, they meet in 5 hours. If the cars travel towards each other, they meet in 1 hour. What are speeds of two cars? [Ex 3.5, Q 4(iv)]

**Sol.** Let the speed of 1<sup>st</sup> car at A =  $x$  km/h and speed of 2<sup>nd</sup> car at B =  $y$  km/h

**First Equation** Suppose after 5 hours they meet at E



$\therefore$  It is observed that  $AE = AB + BE$

$$\left( \begin{array}{c} \text{Distance travelled by} \\ \text{1st car} \end{array} \right) = 100 + \left( \begin{array}{c} \text{Distance travelled} \\ \text{by 2nd car} \end{array} \right)$$

$$\Rightarrow 5x = 100 + 5y \Rightarrow 5x - 5y = 100$$

(Distance = Speed  $\times$  Time)

$$\text{or } x - y = 20 \dots\dots\dots \text{i)}$$

{Divide both sides by 5}

**Second Equation**

Suppose after an hour they meet at P.



$$AP + PB = AB$$

$$\left( \begin{array}{c} \text{Distance travelled by} \\ \text{1st car} \end{array} \right) + \left( \begin{array}{c} \text{Distance travelled} \\ \text{by 2nd car} \end{array} \right) = 100$$

$$\Rightarrow 1x + 1y = 100 \Rightarrow x + y = 100 \dots\dots\dots \text{ii)}$$

$$\text{Adding i) \& ii), we get } (x - y) + (x + y) = 20 + 100$$

$$\Rightarrow 2x = 120 \Rightarrow x = 60$$

Replace this value in equation i), we get

$$\text{i)} \Rightarrow 60 - y = 20 \Rightarrow y = 40$$

Hence Speed of 1<sup>st</sup> car is 60 km/h & speed of 2<sup>nd</sup> car is 40 km/h