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(Affiliated to CBSE up to +2 Level)

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SUB.: MATHEMATICS

Important Questions From Board Papers

1. A man covers a distance of 15 km in 3 hours partly by walking and partly by running. If he walks at 3 km/h and runs at 9 km/h, find the distance he covers by running.

[Answer: 9 km]

Let the time he walks be x hours

From the given condition

$$3(x) + 9(3-x) = 15$$

$$\Rightarrow 6x = 12$$

$$\Rightarrow x = 2$$

So the time he runs is $3 - 2 = 1$ hour

Distance covered by running is $1 \times 9 = 9$ km

2. A and B are two points 150 km apart on a highway. Two cars start with different speeds from A and B at same time. If they move in same direction, they meet in 15 hours. If they move in opposite direction, they meet in one hour. Find their speeds.

[Answer: 80 km/h, 70 km/h]

Let, speed of car at "A" be x km/h

speed of car at "B" be y km/h

Distance covered by car "A" in 15 hours = $15x$

Distance covered by car "B" in 6 hours = $15y$

Since both the cars are travelling in the same direction, sign should be negative

$$15x - 15y = 150$$

$$15(x - y) = 150$$

$$x - y = 150/15$$

$$x - y = 10 \dots\dots\dots (1)$$

Since both the cars are travelling in opposite directions, sign should be positive.

$$x + y = 150 \dots\dots\dots (2)$$

On Adding eq (1) and (2)

$$x - y = 10$$

$$x + y = 150 \quad \text{[by elimination method]}$$

$$2x = 160$$

$$x = 160/2$$

$$x = 80 \text{ km/h}$$

On Putting $x = 80$ in eq. (1)

$$x - y = 10$$

$$80 - y = 10$$

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$$-y = 10 - 80$$

$$-y = -70$$

$$y = 70 \text{ km/h}$$

Hence, the speeds of the two cars are 80 km/h & 70 km/h.

3. A man invested ₹3500, part of it in a yearly interest rate of 4% and the rest at 5%. He receives a total annual interest of ₹153. How much did he invest at each rate?

[Answer: ₹2200 at 4% and ₹1300 at 5%]

Let x be the amount he invested at 4%

So, the amount he invested at 5% is $3500 - x$

Now we are given that He received a total annual interest of Rs.153.

Formula : $PRT/100$

ATQ

$$\text{OR } x \cdot 4.1/100 + (3500 - x) \cdot 5.1/100 = 153$$

$$x/25 + 3500 - x/20 = 153$$

therefore $x = 2200$

He invested Rs.2200 at 4%

The amount he invested at 5% is $3500 - x = 3500 - 2200 = 1300$

Hence He invested Rs.2200 at 4% and He invested Rs.1300 at 5%

4. A boat Covers 32 km upstream and 36 km downstream, in 7 hours. Also it Covers 40 km upstream and 48 km downstream in 9 hours. Find the speed. Of boat in still water and that of the stream.

[Answer: 10 km/h, 2 km/h]

5. The sum of the numerator and denominator of a fraction is 4 more than twice the numerator. If the numerator and denominator are increased by 3, they are in the ratio 2:3. Determine the fraction.

[Answer: 5/9]

6. Raju used 2 plastic bags and 1 paper bag in a day which cost him ₹ 35. While Ramesh used 3 plastic bags and 4 paper bags per day, which cost him ₹ 65. Find the cost of each bag.

[Answer: 15, 5]

7. 8 Women and 12 men can complete a work in 10 days while 6 women and 8 men can complete the same work in 14 days. Find the time taken by one woman alone and that one man alone to finish the work.

[Answer: 1 woman in 140 days, 1 man in 280 days]

8. The ratio of incomes of two persons A and B is 3:4 and the ratio of their expenditures is 5:7. If their savings are ₹ 15,000 annually find their annual incomes.

[Answer: ₹90000, ₹120000]

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