



Exercise 3E

Question 38:

Let P and Q be the cars starting from A and B respectively and let their speeds be x km/hr and y km/hr respectively.

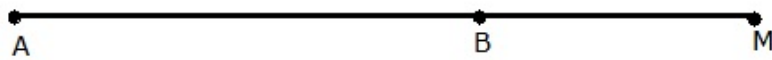
Case- I

When the cars P and Q move in the same direction.

Distance covered by the car P in 7 hours = $7x$ km

Distance covered by the car Q in 7 hours = $7y$ km

Let the cars meet at point M.



$AM = 7x$ km and $BM = 7y$ km

$AM - BM = AB$

$7x - 7y = 70$

$7(x - y) = 70$

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

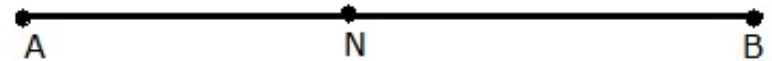
Case II

When the cars P and Q move in opposite directions.

Distance covered by P in 1 hour = x km

Distance covered by Q in 1 hour = y km

In this case let the cars meet at a point N.



$AN = x$ km and $BN = y$ km

$AN + BN = AB$

$x + y = 70$ ---(2)

Adding (1) and (2), we get

$2x = 80$

$x = 40$

Putting $x = 40$ in (1), we get

$40 - y = 10$

$y = (40 - 10) = 30$

$x = 40, y = 30$

Hence, the speeds of these cars are 40 km/ hr and 30 km/ hr respectively.

Question 39:

Let the original speed be x km/h and time taken be y hours

Then, length of journey = xy km

Case I:

Speed = $(x + 5)$ km/h and time taken = $(y - 3)$ hour

Distance covered = $(x + 5)(y - 3)$ km

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

$xy + 5y - 3x - 15 = xy$

$5y - 3x = 15$ ---(1)

Case II:

Speed $(x - 4)$ km/hr and time taken = $(y + 3)$ hours

Distance covered = $(x - 4)(y + 3)$ km

$(x - 4)(y + 3) = xy$

$xy - 4y + 3x - 12 = xy$

$3x - 4y = 12$ ---(2)

Multiplying (1) by 4 and (2) by 5, we get

$20y - 12x = 60$ ---(3)

$$-20y + 15x = 60 \text{ ---(4)}$$

Adding (3) and (4), we get

$$3x = 120$$

$$\text{or } x = 40$$

Putting $x = 40$ in (1), we get

$$5y - 3 \times 40 = 15$$

$$5y = 135$$

$$y = 27$$

Hence, length of the journey is $(40 \times 27) \text{ km} = 1080 \text{ km}$

***** END *****