

Q19. Case Study based-3 :

Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour.



- (a) Assuming that the speed of first car ^{be u km/hr} and second car be v km/h respectively.
What is the relative speed of both cars while they are travelling in the same direction?
- (i) $u+v$ km/hr (ii) $u-v$ km/hr
(iii) u/v km/hr (iv) uv km/hr
- (b) What is the relative speed of both cars while they are travelling towards each other?
- (i) $u+v$ km/hr (ii) $u-v$ km/hr
(iii) u/v km/hr (iv) uv km/hr
- (c) What is the actual speed of one car?
- (i) 60 km/hr (ii) 40 km/hr
(iii) 100 km/hr (iv) 20 km/hr
- (d) What is the actual speed of other car?
- (i) 60 km/hr (ii) 40 km/hr
(iii) 100 km/hr (iv) 20 km/hr
- (e) The given problem is based on which mathematical concept
- (i) Pair of linear equations (ii) Quadratic equations
(iii) Polynomials (iv) none of these

X Case-Study 7 (Answers)

1) $AB = AC - BC$

$$100 = 5u - 5v$$

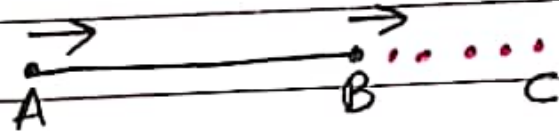
$$100 = 5(u - v) \rightarrow (1)$$

\therefore Relative speed is $(u - v)$ km/hr (ii)

Distance = Speed \times time

$$AC = u \times 5 = 5u \text{ km}$$

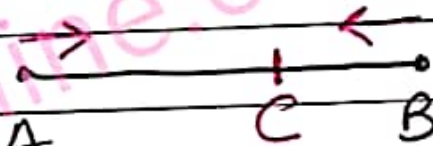
$$BC = v \times 5 = 5v \text{ km}$$



2) $AB = AC + BC$

$$100 = (u + v) \times 1 \rightarrow (2)$$

\therefore Relative speed is $(u + v)$ km/hr (i)



3) From eq: (1), $u - v = 20$

From eq: (2), $u + v = 100$

$$(+), 2u = 120$$

$$u = 60 \text{ km/hr}$$

$$v = 40 \text{ km/hr}$$

$$AC = u \times 1 = u \text{ km}$$

$$BC = v \times 1 = v \text{ km}$$

Speed of first car = 60 km/hr (i)

4) Speed of the other car = 40 km/hr (ii)

5) Pair of linear equations (i)