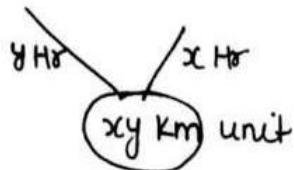


- ① A man cover a certain distance with $x \text{ km/Hr}$ & come back with $y \text{ km/Hr}$. He takes $t \text{ hrs}$ to go and come back. find the distance ?

$x \text{ km/Hr}$ $y \text{ km/Hr}$



$(x+y) \text{ unit} \longrightarrow t \text{ hr.}$

1 unit $\longrightarrow \frac{t}{x+y}$

$xy \longrightarrow \frac{t}{x+y} \times xy \text{ km.}$

$$D = \frac{S_1 \times S_2}{S_1 + S_2} \times [\text{Total Time}]$$



- ② A boy goes to school at 3 km/Hr . and return at a speed of 2 km/Hr . If he takes 5 Hrs in all. find the distance from his village to school?

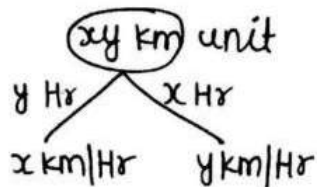
$$D = \frac{3 \times 2}{3+2} \times 5 = 6 \text{ km.} \quad \underline{\text{Ans.}}$$

- ③ A man travel a certain distance by train @ 25 km/Hr . — and walk back @ 4 km/Hr . The whole journey took $5 \text{ Hr } 48 \text{ min}$, what distance did he travel by train.

$$D = \frac{25 \times 4}{25+4} \times \frac{29}{5} = 20 \text{ km}$$

$$\begin{aligned} 5 \text{ Hr } 48 \text{ min} \\ &= 5 \frac{4}{5} \\ &= \frac{29}{5} \end{aligned}$$

- ④ A man go a certain distance with x km/Hr and he comes back with a speed of y km/Hr. If he takes t hrs more to come back than go. find the distance.



$$D = \frac{S_1 \times S_2}{S_1 - S_2} [\text{diff. b/w time}]$$

$$(x-y) \text{ unit} \text{ --- } t$$

$$1 \text{ unit} \text{ --- } \frac{t}{x-y}$$

$$xy \text{ unit} \text{ --- } \frac{t}{x-y} \times xy$$



- ⑤ A man cover a certain distance from house to office if he travel @ 30 km/Hr, then he is late by 10 min but if he travel @ 40 km/Hr then he reaches his office 5 min earlier. Find the distance from home to office.

$$\text{Time diff} = 15 \text{ min}$$

$$D = \frac{30 \times 40}{40 - 30} \times \frac{15}{60} = 30 \text{ km} \quad \underline{\text{Ans}}$$

- ⑥ Starting from his house one day, a student walks @ 2.5 km and reaches his school 6 min late. Next day he ↑ his speed 1 km/Hr and reaches the school 6 min earlier. how far is the school from his house.

$$\text{Time diff} = 12 \text{ min}$$

$$S_1 = 2.5 \text{ km/Hr}, S_2 = 2.5 + 1 = 3.5 \text{ km/Hr}$$

$$D = \frac{\frac{5}{2} \times \frac{7}{2}}{1} \times \frac{12}{60} = \frac{5}{2} \times \frac{7}{2} \times \frac{1}{5} = \frac{7}{4} \text{ km.}$$

- ⑦ A man cover a certain distance by 10 km/Hr and becomes 15 min late. But if he travel the same distance with 12 km/Hr then he becomes 5 min late find the distance ?

$$\text{Time diff} = 10 \text{ min}$$

$$D = \frac{10 \times 12^2}{2} \times \frac{10}{60-6} = 10 \text{ km.}$$

- ⑧ A man cover a certain distance on scooter and he travel 3 km per hr faster he would have taken 40 min less. But if he decrease his speed 2 km/Hr then he becomes 40 min late. find the distance.

$$D = \frac{S \times (S+3)}{3} \times \frac{40}{60} = \frac{S(S-2)}{2} \times \frac{40}{60} \quad \begin{array}{l} \text{Time diff} = 40 \text{ (In 1st case)} \\ \text{40 (In 2nd case)} \end{array}$$

$$\Rightarrow 2S+6 = 3S-6$$

$$S = 12 \text{ km/Hr.}$$

$$D = \frac{12 \times 15}{3} \times \frac{40^2}{60-3} = 40 \text{ km/Hr.}$$

- ⑨ A man cover a certain distance by his car. Had he travel 6 km/Hr faster then he take 4 hr less time. But if he drive 6 km/Hr slower then he takes 6 Hrs more. find the distance.

$$\frac{S \times (S+6)}{S+3} \times 4^2 = \frac{S \times (S-6)}{S-6} \times 6$$

$$2S+12 = 3S-18$$

$$S = 30 \text{ km/Hr}$$

$$D = \frac{30 \times 36}{6} \times 4 = 720 \text{ km}$$

Ans.

- ⑩ A man travel a certain distance by his car. If he ⁵⁸ increase his speed 10 km/Hr then he would take 1 Hr less time. But if he further increase his speed 10 km/Hr then he takes further 45 min lesser time. find the distance ?

$$\frac{S \times (S+10)}{10} \times 1 = \frac{S(S+20)}{20} \times \frac{7}{4}$$

$$1 \frac{45}{60} = \frac{7}{4}$$

$$8S + 80 = 7S + 140$$

$$S = 60 \text{ km/Hr}$$

$$D = \frac{60 \times 70}{10} \times 1 = 420 \text{ km.}$$

- ⑪ If a man had walk 20 km/Hr faster he would have save 1 Hr in the distance of 600 km. find his usual speed ?

$$\frac{S \times (S+20)}{20} \times 1 = 600$$

$$\Rightarrow S(S+20) = 12000 \text{ km.}$$



Took value of S from options.

$$\frac{100 \times (100+20)}{S \times (S+20)}$$

$$S = 100 \text{ km/Hr.}$$

- ⑫ In a flight of 600 km an aircraft slow down due to bad weather, its avg speed for the trip reduced by 200 km/Hr & the time of flight increased by 30 min. find the original speed ?

$$\Rightarrow \frac{S \times (S - 200)}{200} \times \frac{1}{2} = 600$$

$$\Rightarrow S \times (S - 200) = 600 \times 400$$

$$\downarrow$$

$$600$$

$$S = 600 \text{ km/Hr.}$$

CLASS

8

By  Chhoker

720646927

- (13) If a train with a speed of 60 km/Hr cross a pole in 30 sec. find the length of the train?

$$\text{km/Hr} \times \frac{5}{18} = \text{m/sec}$$

Distance = speed $\times$ Time.

$$\text{m/sec} \times \frac{18}{5} = \text{km/Hr}$$

$$\frac{60}{10} \times \frac{5}{18} \times 30 = 500 \text{ mtr.}$$

- (14) A 100 m long train with a speed of 30 km/Hr can cross a man in how much time?

$$100 = 30 \times \frac{5}{18} \times T$$

$$T = 12 \text{ sec.}$$

- (15) A train running at a speed of 72 km/Hr crossed a 260 m platform in 23 sec. find the length of train?

$$260 + \text{Train length} = 72 \times \frac{5}{18} \times 23 = 460$$

$$\text{Train length} = 460 - 260 = 200 \text{ mtr.}$$

- 60
- (16) A 275 m long train crosses a platform of equal length in 33 sec. find the speed of the train?
- Total distance covered by train to cross the platform = $275 + 275 = 550\text{m}$

$$550 = S \times 33$$

$$S = \frac{550}{33-3} = \frac{50}{3} \text{ m/sec} = \frac{10}{3} \times \frac{18}{5}^6 = 60 \text{ km/hr}$$

- (17) A train running at a speed of 60 km/hr crosses a platform double of its length in 32.4 sec. find the length of the platform?

$$\text{length of train} = x$$

$$\text{length of platform} = 2x$$

$$\text{Total distance in crossing} = x + 2x = 3x$$

$$3x = \frac{60 \times 5}{18} \times \frac{32.4}{10} = 180$$

$$x = 180$$

$$\text{length of train} = 180 \text{ m}$$

$$\text{length of platform} = 180 \times 2 = 360 \text{ m.}$$



Relative speed

→ S_1 Two objects in same direction
→ S_2 Relative speed = $(S_1 - S_2)$

→ S_1 Two objects in opposite direction
← S_2 Relative speed = $(S_1 + S_2)$

- (18) A train crosses a man with a speed of 72 km/hr in 15 sec. find in how much time it will cross another train which is 50% more long than it if the other train is standing on platform?

$$\text{length of Train}_1 = 72 \times \frac{5}{18} \times 15 = 300 \text{ m}$$

$$\text{length of Train}_2 = 50\% \text{ more} = \frac{150}{100} \times 300 = 450 \text{ m}$$

Total distance to be covered by Train 1 in crossing

$$\text{Train 2} = 300 + 450 = 750 \text{ m}$$

$$\frac{150}{750} = \frac{4}{72 \times \frac{5}{18}} \times T$$

$$T = \frac{150}{4} = 37\frac{1}{2} \text{ sec.}$$

- (19) A train crosses a tunnel half of its length with a speed of 72 km/hr in 1 min, then find in how much time it will cross another train of double length w/c is standing on platform with 60% of its speed?

$$\text{Train length} = 2L$$

$$\text{Tunnel length} = L$$

$$3L = 72 \times \frac{5}{18} \times 60$$

$$L = 400 \text{ m.}$$

$$\text{Train 1} = 400 \times 2 = 800 \text{ m}$$

$$\text{Train 2} = 2 \times 800 = 1600 \text{ m}$$

$$T_1 = 800$$

$$T_2 = 1600$$

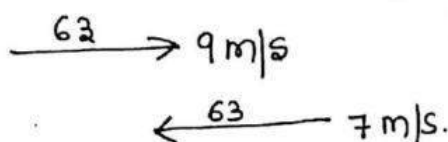
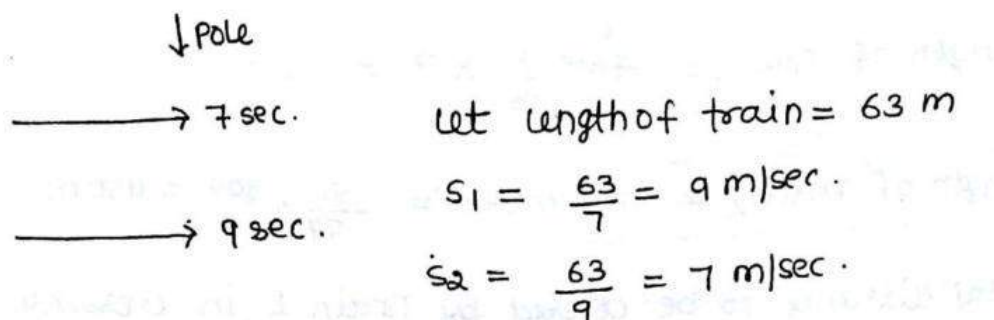
$$\text{Total distance in crossing} = 2400$$

$$60\% \text{ of speed} = 12 \text{ m/sec.}$$

$$\therefore 2400 = 12 \times t$$

$$T = 200 \text{ sec. } \underline{\underline{\text{Ans}}}$$

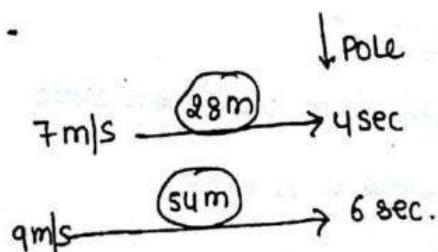
- (20) 2 trains of same length can cross a pole in 7 sec & 9 sec. respectively. In how much time will they cross each other if they are coming from opposite direction.



Relative speed = $7 + 9$
= 16.

Time of cross = $\frac{126}{16} = \frac{63}{8} \text{ sec.}$

- (21) 2 trains can cross a pole in 4 sec and 6 sec respectively. Find in how much time will they cross each other if they are coming from same direction & if the speed of the trains are in 7 : 9 ratio.



Total distance = $28 + 54 = 82 \text{ m}$

Relative speed in same dir = $9 - 7 = 2$

Time of cross = $\frac{82}{2} = 41 \text{ sec.}$

- (22) The speed of two train in the ratio 3 : 4. Both crosses a pole in 3 sec while coming from opposite direction. In how much time they will cross each other?

3 m/s — (9 mt) — 3 sec

4 m/s — (12 mt) — 3 sec

$$\text{Total distance} = 9 + 12 = 21$$

Relative speed in opposite

$$\text{dir} = 3 + 4 = 7$$

$$\text{Time of cross} = \frac{21}{7} = 3 \text{ sec} \quad \underline{\text{Ans}}$$

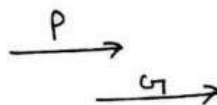
- (23) A goods train and passenger train are running in same direction with a speed in the ratio 1:2. The driver of goods train observes that the passenger train coming from behind overtake and crossed his train completely in 60 sec. whereas a passenger on passenger train looks that he cross the goods train in 40 sec. find the ratio of their length.

$$\text{Goods Train (G)} = 1 \text{ m/sec}$$

$$\text{Passenger Train (P)} = 2 \text{ m/sec.}$$

Relative speed in same

$$\text{direction} = 2 - 1 = 1 \text{ m/sec}$$



$$P + G = 1 \text{ m/sec} \times 60$$

$$P + G = 60 \text{ mt.}$$

$$G \longrightarrow 1 \text{ m/sec.}$$

$$\bullet \longrightarrow 2 \text{ m/sec.}$$

man

$$G = 1 \text{ m/sec} \times 40$$

$$G = 40 \text{ mtr.}$$

$$P + G = 60$$

$$\downarrow \quad \downarrow$$

$$20 \quad 40$$

$$G : P$$

$$40 : 20$$

$$2 : 1$$



Ans

⊕

G	:	P
(Time Taken by Passenger)		Time Taken to cross both train each other
		Time Taken to cross the goods train by passenger

24) The ratio of speeds of a goods and passenger train is 7:9 in same direction. If the passenger train crosses the goods train in 60 sec while a passenger in the passenger train observes that he crosses the goods train in 35 sec. find the ratio of length of goods train to passenger train?

length of Good Train (G) = 7 m/sec

length of Passenger Train (P) = 9 m/sec

Relative speed in same dir'n = $9 - 7 = 2$ m/sec.

$(P + G) = 2 \times 60 = 120$

$G \rightarrow 7$ m/sec

man $\rightarrow 9$ m/sec.

Relative Speed = $9 - 7 = 2$

$G = 2 \times 35 = 70$.

$\therefore P + G = 120$

$\downarrow$
50 $\downarrow$
70

G : P

70 : 50

7 : 5

Ans

OR

G : P

35 : 60 - 35

35 : 25

7 : 5

Ans

- 25 A train overtakes a man going along the railway track at a speed of 6 km/Hr in 10 sec if the length of the train is 200 m. Find the speed of the train ? 65

Train 200 $\rightarrow$ x km/Hr

$\rightarrow$ man 6 km/Hr
10 sec.

$$\frac{200}{x-6} = (x-6) \times \frac{5}{18} \times 10$$

$$x = 78 \text{ km/Hr}$$

By Pardeep Chhoker
7206446517

- 26 A gun is fired from behind a train the driver of train hears the sound $1\frac{1}{2}$ min later than guard. Find the length of train if the speed of train & sound are 60 km/Hr and 1100 m/min.

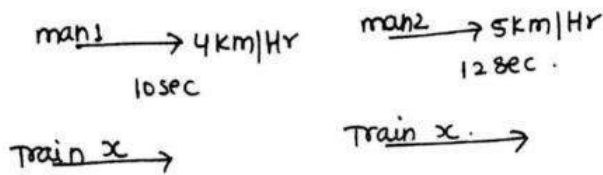
Train $\rightarrow$ 1000 m/min

Sound $\rightarrow$ 1100 m/min

$$\frac{60,000}{60} = 1000 \text{ m/min.}$$

$$D = \frac{100 \times \frac{3}{2}}{\downarrow \text{Relative speed in same dir.}} = 150 \text{ mt.}$$

- 27 A train can cross 2 men going along the railway track at 4 km/Hr & 5 km/Hr in same direction in 10 sec & 12 sec. Find the length of train.



$$(x-4) \times \frac{5}{18} \times 10 = (x-5) \times \frac{5}{18} \times 12$$

($\because$ Both are length of trains. so equate them)

$$5x-20 = 6x-30$$

$$x = 10 \text{ km/Hr.}$$

$$\text{length of train} = (10-4) \times \frac{5}{18} \times 10 = \frac{50}{3} \text{ metre}$$

Ans.

(OR)

$$10 \times 4 = 40$$

$$12 \times 5 = 60$$

$$12-10 = 2$$

$$\text{Speed} = \frac{60-40}{2} = 10 \text{ km/Hr}$$

$$\text{length} = (10-4) \times \frac{5}{18} \times 10 = \frac{50}{3} \text{ metre.}$$

[28] A train pass two person who are walking in opposite in w/c the train that is moving @ 5 m/sec & 10 m/sec. in 6 sec and 5 sec respectively. find the length of train.



$$(x+5) \times 6 = (x+10) \times 5$$

$$x = 20 \text{ m/sec.}$$

$$\text{length of train} = (20+5) \times 6 = 150 \text{ mtr.}$$

Ans.

(OR)

$5 \times 6 = 30$

$10 \times 5 = 50$

61

$$\frac{50-30}{1} = 20 \text{ m/sec.}$$

$$\text{length} = (20+5) \times 6 = 150 \text{ mtr.}$$

- [29] Two trains of length 100 m & 80 m respectively run on parallel line. If they run in same direction they cross each other in 18 sec But if they are coming from opposite direction they cross each other in 9 sec. find the speed of faster train.

किसी भी direction में cross करे distance $(100+80) = 180$ ही होगा cross करने के लिए ।

Speed of 1st train (x)

speed of 2nd train (y)

$$x - y = 10$$

$$\underline{x + y = 20.}$$

$$x = 15 \text{ km/hr}$$

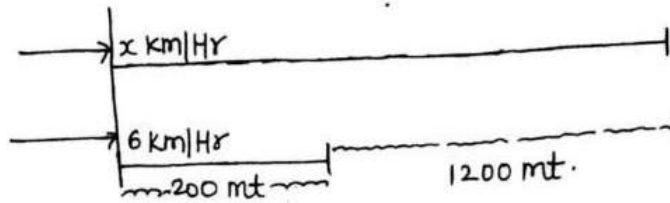
$$y = 5 \text{ m/sec.}$$



$$\frac{180}{18} = 10$$

$$\frac{180}{9} = 20$$

- [30] A truck crosses a man moving along the road at 6 km/hr. The man could see the truck upto 2 min find the speed of truck, at the time of disappearance the distance of truck to man is 1.2 km ?



$$\text{distance travelled by man in 2 min} = \frac{6 \times 2}{60} \\ = 0.2 \text{ km} = 200 \text{ mt.}$$

$$\text{distance covered by truck} = 200 + 1200 = 1400 \quad \left| \quad \text{Time} = \frac{2}{60} = \frac{1}{30} \text{ Hr.} \right.$$

$$S = \frac{D}{T} = \frac{1400}{1/30} = 1400 \times \frac{30}{1} = 42 \text{ km/Hr.}$$

(OR)

$$D = S \times T$$

$$1.2 = (x - 6) \times \frac{2}{60}$$

$$36 = x - 6$$

$$x = 42 \text{ km/Hr}$$



- [31] A carriage driving in a fog passed a man who was walking at the rate of 3 km/Hr in same direction. He could see the carriage for 4 min & it was visible to him upto a distance of 100 m. What was the speed of the carriage?

$$D = S \times T$$

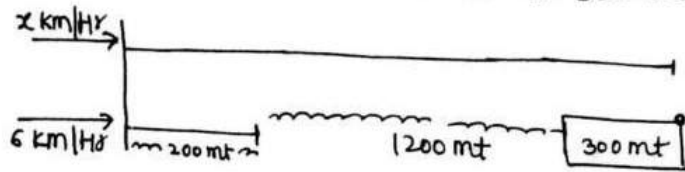
$$100 \text{ m} = \frac{1}{10} \text{ km}$$

$$\frac{1}{10} = (x - 3) \times \frac{4}{60}$$

$$3 = 2x - 6$$

$$x = 4.5 \text{ km/Hr.}$$

- 32] A train crosses a man going along the railway track at 6 km/Hr. The man could see the train upto 2 min and then find the speed of the train if at the time of disappearance the distance b/w train to man was 1.2 km ? & length of train is 300 metre ?



distance covered by man in 2 min = 200 mtr.

Total distance by train = 200 + 1200 + 300 = 1700 mtr.

$$T = 2 \text{ min} = \frac{1}{30} \text{ Hr.}$$

$$S = \frac{1.7}{1/30} = 51 \text{ km/Hr}$$

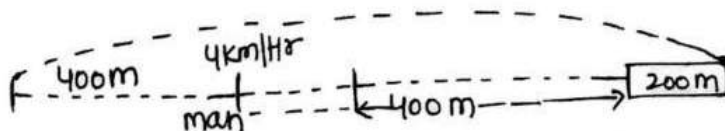
OR

$$1.5 = (x-6) \times \frac{2}{60}$$

$$x = 51 \text{ km/Hr.}$$



- 33] A man could see 400 m during fog when he was moving with 4 km/Hr, he saw a train coming from behind & disappeared in 3 min. If the length of train is 200 m, find the speed of the train ?



Total distance by train = 400 + 400 + 200 = 1000 m = 1 km

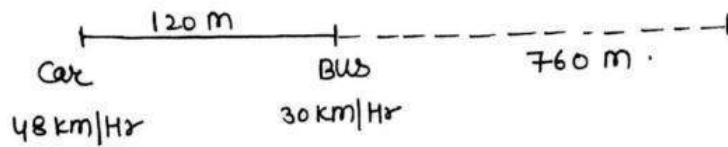
$$1 = (x-4) \times \frac{3}{60}$$

$$x = 24 \text{ km/Hr}$$

$$D = S \times T$$

[अगर detail solve करेंगे तो man का 3 min का distance भी लेंगे]

- 70
 [34] A car is 120 m behind the bus, in how much time it will be 760 m ahead of bus if their speed are 48 km/Hr and 30 km/Hr ?



$$\begin{aligned}\text{Relative Speed} &= 48 - 30 = 18 \text{ km/Hr} \\ &= 18 \times \frac{5}{18} = 5 \text{ m/sec.}\end{aligned}$$

distance to be covered by ~~bus~~_{car} = $120 + 760 = 880$.

$$\text{Time} = \frac{880}{5} = 176 \text{ sec. } \underline{\text{Ans.}}$$

CLASS

9

By Pardeep Chhoker

7206446517

- [35] A theft is reported at 10 pm and police started chasing the thief at 1:00 am. calculate at what time the police will catch the thief, if speed of thief and police are 42 km/Hr and 49 km/Hr.

- 10:00 pm $\rightarrow$ 42 km/Hr

1:00 am $\rightarrow$ police have to cover 42×3 km distance

with Relative speed = $49 - 42 = 7$ km/Hr

$$\text{Time} = \frac{42 \times 3}{7} = 18 \text{ Hrs.}$$

- 36 A boy plants a bomb at a place and starts running at 30 m/sec. After 56 sec the bomb was blast, in how much time the sound of blast will be listen by the boy if the speed of sound is 450 m/sec.

$$\text{Boy} \rightarrow 30 \text{ m/sec}$$

$$\text{Sound} \rightarrow 450 \text{ m/sec}$$

$$\text{distance travelled by boy in 56 sec} = 30 \times 56 \text{ m}$$

$$\text{Relative speed of sound w.r.t. boy} = 450 - 30 = 420 \text{ m/sec}$$

$$\text{Time} = \frac{30 \times 56}{420} = 4 \text{ sec}$$

$\therefore$ After 4 sec. boy will hear the sound of blast.

- 37 A dog chases rabbit. The rabbit is 125 leaps ahead of itself jumps from dog. The rabbit can jump 4 times in a time in which the dog can jump 3 times. The distance covered by the rabbit & dog in one jump is 1.75 and 2.75 m. In how many jumps the dog will catch the rabbit?

R	D
1.75	2.75
7	11

$\downarrow$
distance in one jump.



distance covered by Rabbit in

$$125 \text{ jump} = 125 \times 7$$

$$\text{Dog} = 3 \times 11 = 33 \text{ m/sec}$$

$$\text{Rabbit} = 4 \times 7 = 28 \text{ m/sec}$$

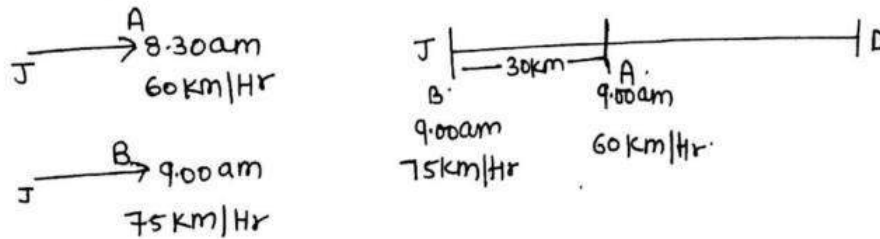
$$\text{Relative speed of dog w.r.t rabbit} \\ 33 - 28 = 5 \text{ m/sec}$$

$$\text{chasing Time} = \frac{125 \times 7}{5}$$

$$= 175 \text{ sec} \quad \underline{\text{Ans.}}$$

$$\text{jumps} = 175 \times 3 = 525 \text{ jumps} \quad \underline{\text{Ans}}$$

- 38] 2 trains for delhi leaves jaipur at 8:30 am & 9:00 am 72
and travel at 60 km/Hr and 75 km/Hr respectively.
How many km away from jaipur will the two train meet ?



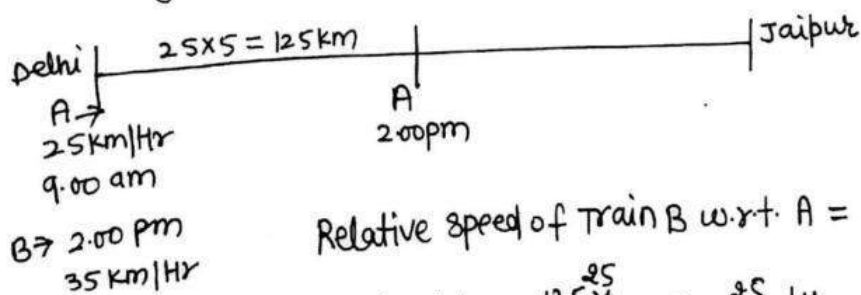
distance travelled by A in 30 min = $\frac{1}{2} \times 60 = 30$ km.

Relative speed = $75 - 60 = 15$ km/Hr

Time of catch = $\frac{30}{15} = 2$ Hr.

From Jaipur they will meet $\Rightarrow 75 \times 2 = 150$ km.

- 39] A train travelling 25 km/Hr leaves delhi at 9:00 am, another train travelling 35 km/Hr at 2:00 pm, in the same direction. How many train km from delhi will they meet together ?



Relative speed of Train B w.r.t. A = 10 km/Hr

Time of catch = $\frac{125}{10} = 12.5$ Hr

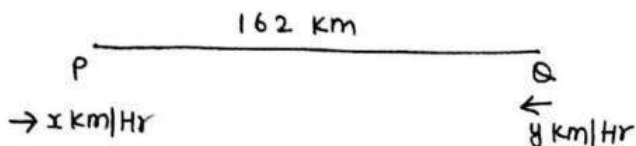
From delhi they meet = distance travelled by train B =

$$35 \times \frac{25}{2} = 437 \frac{1}{2} \text{ km}$$

Ans

40

Two places P & Q are 162 km apart. Two trains start from P & Q towards each other at same time and meet after 6 Hrs. Speed of one train is 8 km/Hr faster than other. find the speed of both the trains.



$$x + y = \frac{162}{6} = 27 \quad \left(\text{Relative speed in opposite direction will be added} \right)$$

$$x + y = 27$$

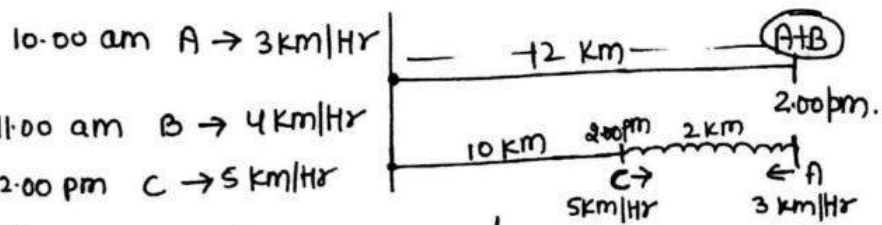
$$x - y = 8$$

$$x = \frac{35}{2} \text{ km/Hr}$$

$$y = \frac{19}{2} \text{ km/Hr}$$

41

A, B and C start from Delhi at 10am, 11am & 12.00 towards Goa & their speed are 3km/H, 4km/H & 5 km/H & After meeting on the way, B send back A to C with a message. At what time C will get the message?



$$A \text{ in } 1 \text{ Hr} = 3 \text{ Km}$$

$$R.S \text{ of } B = 1 \text{ km/Hr}$$

$$\text{Time of catch} = \frac{3}{1} = 3 \text{ Hr after}$$

ie 11:00am + 3Hr = 2:00 pm.
distance by B in 3Hr = $3 \times 4 = 12 \text{ Km}$.

$$\begin{aligned} \text{Time of message b/w A \& C} &= \frac{(2)}{(5+3)} \rightarrow \text{distance b/w them} \\ &= \frac{2}{8} = \frac{1}{4} \times 60 = 15 \text{ min} \end{aligned}$$

Relative speed

meet at 2:15 pm.

42 Two trains starts at same time from delhi and 74
jaipur towards each other with a speed of 80 km/Hr
and 95 km/Hr. When they meet the faster train cover
180 km more distance than the other. find the
distance b/w delhi & jaipur.



let they meet after x Hr
So distance travelled by 1st train in x Hr = $80x$
distance travelled by 2nd train in x Hr = $95x$
distance b/w Delhi & Jaipur = $80x + 95x = 175x$

Now: $95x - 80x = 180 \text{ km}$

$$15x = 180$$

$$x = 12 \text{ Hr}$$

so they will meet after 12 Hr
Distance b/w Delhi & Jaipur = $175 \times 12 = 2100 \text{ km}$

(OR) let they meet after 1 Hr.

Total distance = $80 + 95 = 175 \text{ km}$

$$\therefore 95 - 80 = 15 \text{ unit} \text{ ————— } 180$$

$$1 \text{ unit} \text{ ————— } 12$$

$$\therefore \text{ they meet after } = 1 \times 12 = 12 \text{ Hr}$$

$$\therefore \text{ Distance b/w Delhi \& Jaipur } = 175 \times 12 = 2100 \text{ km} \quad \underline{\underline{\text{Ans}}}$$

- [43] Two trains start at same time from two stations towards each other @ 20 km/hr and 25 km/hr . When they meet the faster train cover 80 km more distance than other. find the distance.



let they meet after 1 hr .

$$\text{Then distance} = 20 \times 1 + 25 \times 1 = 45 \text{ km.}$$

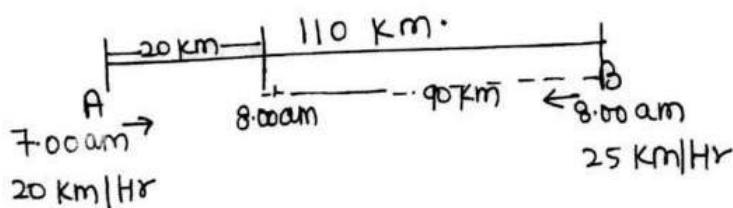
$$\therefore 25 - 20 = 5 \text{ km} \quad \text{-----} \quad 80$$

$$1 \text{ unit} \quad \text{-----} \quad 16 \text{ km.}$$

$$\therefore \text{They meet after} = 1 \times 16 = 16 \text{ hr.}$$

$$\text{distance} = 16 \times 45 = 720 \text{ km.}$$

- [44] Two stations A and B are 110 km apart. One train starts from A at $7:00 \text{ am}$ and travel towards B. at 20 km/hr . Another train starts from B at $8:00 \text{ am}$ towards A at 25 km/hr . At what time will they meet?

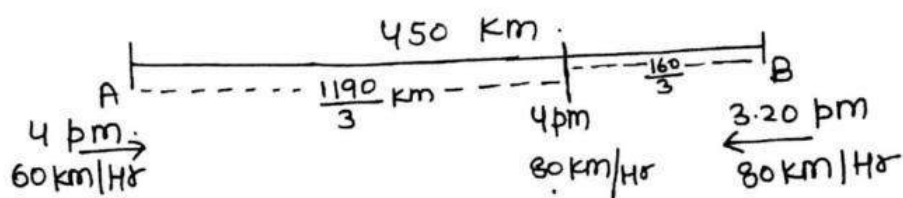


$$\text{Relative speed} = 20 + 25 = 45 \text{ km/hr.}$$

$$\text{Time of meet} = \frac{90}{45} = 2 \text{ hrs}$$

$$\Rightarrow 8:00 \text{ am} + 2 \text{ hr} = 10:00 \text{ am} \quad \underline{\underline{\text{Ans}}}$$

45] The distance b/w two stations A and B is 450 km. A train starts at 4 pm with 60 km/hr from A to B. Another train starts from station B at 3:20 pm towards A with a speed of 80 km/hr. At what time will the both train meets.



By B in 40 min
 $\frac{40}{60} \times 80$
 $= \frac{160}{3} \text{ km.}$

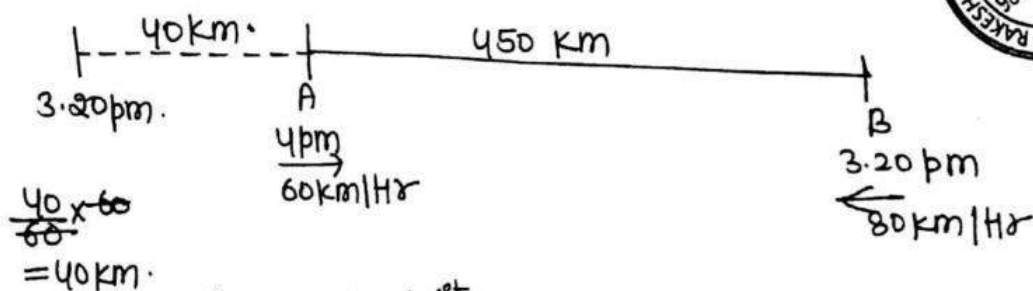
Let meet after 1 hr then distance = $60 + 80 = 140 \text{ km.}$

$$\frac{140}{1 \text{ unit}} = \frac{\frac{1190}{3}}{\frac{17}{2}} = \frac{17}{6} = 2 \frac{5}{6} \text{ Hr} = 2 \text{ Hr } 50 \text{ min}$$

meet after 2 hr 50 min.

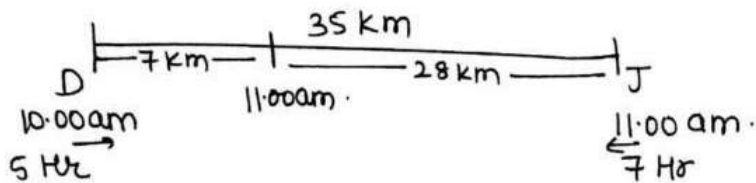
ie 4 pm + 2 hr 50 min = ~~6:40 PM~~
 6:50 pm. Ans

OR



Assume that 1st train starts at 3:20.
 Total distance = $40 + 450 = 490$
 R.S = $60 + 80 = 140$
 Time of meet = $\frac{490}{140} = 3.50 \text{ Hr.}$
 $3:20 \text{ pm} + 3:30 \text{ Hr} = 6:50 \text{ pm}$

- 46] A train starts from Jaipur at 10:00 am and reach delhi at 3:00 pm. Another train starts from delhi at 11 am and reach jaipur at 6:00 pm. find the meeting time.



let distance = 35 km.

speed of D = 7 km/hr

Speed of J = 5 km/hr

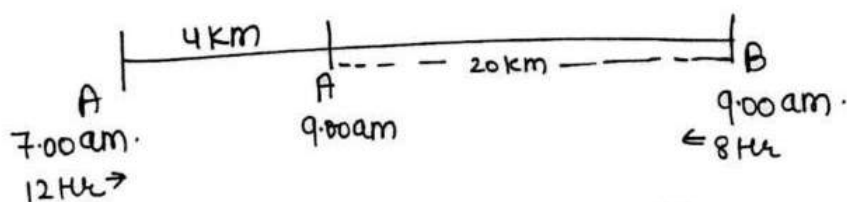
$$\left(\begin{array}{l} \therefore \frac{35}{5} = 7 \\ \frac{35}{7} = 5 \end{array} \right)$$



$$\text{meeting Time} = \frac{28}{12} = 2\frac{1}{3} \text{ Hr} = 2 \text{ Hr } 20 \text{ min}$$

ie they will meet 11:00 + 2 Hr 20 min = 1:20 pm Ans

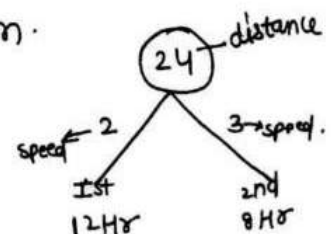
- 47] A train starts from station A at 7:00 am and reaches station B at 7:00 pm. Another train starts from station B at 9:00 am and reaches station A at 5 pm. find the time when they meet?



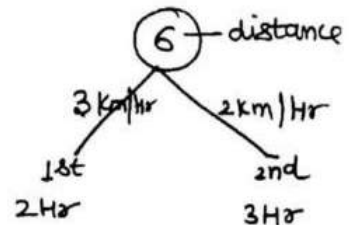
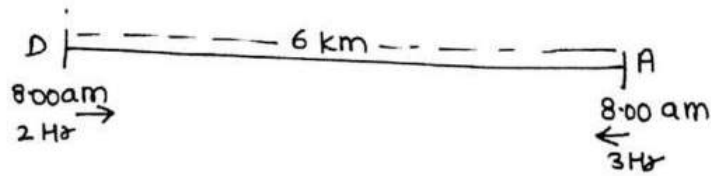
$$\text{Relative speed} = 12 + 8 = 20 \text{ km/hr}$$

$$\text{meeting Time} = \frac{20}{5} = 4 \text{ Hr}$$

$$9:00 \text{ am} + 4 \text{ Hr} = 1:00 \text{ pm} \quad \underline{\underline{\text{Ans}}}$$



- 78
 [48] A train starts from Delhi at 8:00 am & reached Agra at 10 am. Another train starts from Agra at 8:00 am & reached Delhi at 11:00 am. Find the meeting time?



$$\text{meeting Time} = \frac{6}{5} = 1.2 \text{ Hrs.}$$

$$8:00 \text{ am} + 1.2$$

$$= 9:12 \text{ am} \quad \underline{\underline{\text{Ans}}}$$

- [49] By walking $\frac{6}{7}$ of his usual speed a man is 12 min late. Find the usual time taken by him to cover that distance.

Speed
 $\frac{6}{7}$

Time
 $\frac{7}{6} \rightarrow 1 \text{ unit} \text{ — } 12 \text{ min}$

usual time = $6 \times 12 = 72 \text{ min}$ Ans

[50]

In covering a certain distance the ratio of speed of A & B is 3:4. A takes 30 min more than B to reach the destination. Find the time taken by A to reach the destination?

	Speed	Time
A	3	4
B	4	3

1 unit $\xrightarrow{\times 30}$ 30 min

usual time taken by A = $4 \times 30 = 120$ min

& By B = $3 \times 30 = 90$ min.

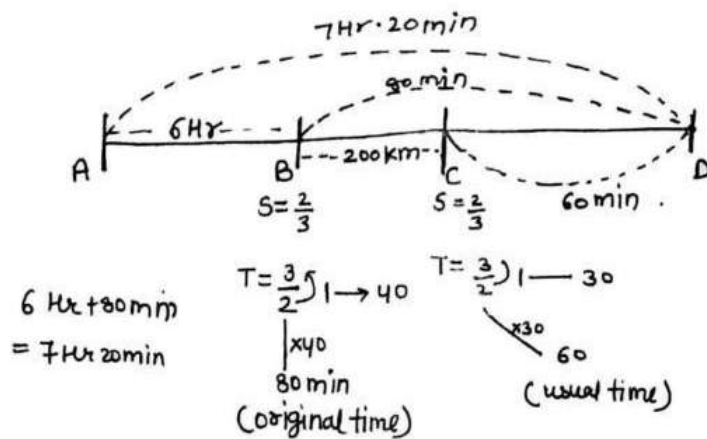
- 51] A person running at $\frac{7}{11}$ of its usual speed reached a place in 22 hrs. How much time would he save had he run his normal speed?

Speed	Time
$\frac{7}{11}$	$\frac{11}{7}$ $\xrightarrow{\times 2}$ 22 hrs.
	usual time

11 unit	22
1 unit	2
7 unit	14

usual time = 14 hrs.
He would have save $\Rightarrow 22 - 14 = 8$ hrs.

- 52] A train starts from Delhi at 8:00 am. After 6 hrs there was a breakdown in the train, due to which it travels $\frac{2}{3}$ of its normal speed and hence becomes 40 mins late. If the breakdown would be 200 km further then it becomes 30 min late only. find the distance from Delhi to Agra?



From point B to D usual time of train = 80 min

$\therefore$ time from A to D = 7 Hr 20 min

From C to D usual time = 60 min

$\therefore$ B to C train takes $(80 - 60) = 20$ min and this distance is given 200 km.

$$T = \frac{20}{60} = \frac{1}{3} \text{ Hr}$$

$$\text{Speed} = \frac{200}{1/3} = 600 \text{ km/Hr}$$

Distance from A to D = $S \times T$

$$= \frac{200}{600} \times \frac{22}{3}$$

$$= 4400 \text{ km } \underline{\underline{\text{Ans.}}}$$

$$7 \frac{1}{3} = \frac{22}{3} \text{ Hr}$$

	A	B	
speed	4	3	
Time	3	4	
			speed $\propto \frac{1}{\text{Time}}$
			if speed is $\frac{4}{3}$ then time is $\frac{3}{4}$.

OR

$$S \quad \frac{2}{3}$$

T

$$\frac{3}{2} \rightarrow 1 \text{ unit} \text{ --- } 10 \text{ min}$$

$$\swarrow \times 10 \quad 20 \text{ min}$$

$$T = \frac{20}{60} = \frac{1}{3} \text{ Hr}$$

$$D = 200 \text{ km.}$$

$$S = \frac{200}{1/3} = 600 \text{ km/Hr}$$

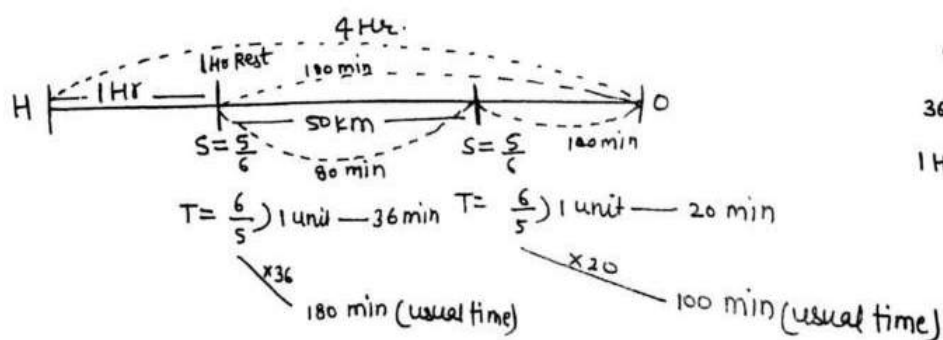
CLASS

10

By Pardeep Chhoker

7206446517

- 53 A man starts from his home to his office with a certain speed but after 1 Hr he meets with an accident & resumes his journey after 1 Hr and becomes 1 Hr 36 min late due to reducing his speed to $\frac{5}{6}$. If the accident would occurred after 50 km then he will be late by 1 Hr 20 min. Find the distance from home to office?



Speed को बजह से
36 min लेट हुआ है
1 Hr तो वैसे खड़ा रहा.

$$S \quad \frac{5}{6} \quad T \quad \frac{6}{5} \rightarrow 1 \text{ unit} \text{ --- } 16 \text{ min}$$

$$\swarrow \times \frac{5}{6} \quad 80 \text{ min}$$

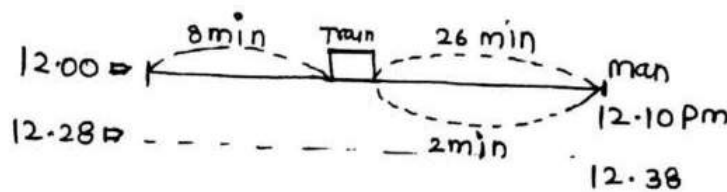
$$D = 50 \text{ km}$$

$$T = \frac{80}{60} = \frac{4}{3} \text{ Hour}$$

$$S = \frac{50 \times 3}{4} = \frac{75}{2} \text{ km/hr}$$

$$\text{Distance b/w home to office} = \frac{75}{2} \times 4 = 150 \text{ km.}$$

[54] 2 guns were fired from same place at an interval of 28 mins. But a man sitting in the train approaching the place hears the 2nd firing 26 min after the 1st. if the speed of sound is 325 m/sec, find the speed of train?



	Time	Speed
Train	26-13	$\xrightarrow{\times 25} 25 \text{ m/s}$
Sound	2-1	$\xrightarrow{\times 25} 325 \text{ m/s}$

$\therefore \text{ speed of Train} = 25 \text{ m/s.}$

[OR]

28
2
जितनी देर बाद
man को सुनाई दी
वो man/train का Time होगा।

26
जो diff होगा
वो sound का Time होगा

man/train	T	S
26-13	26	1
2-1	2	13

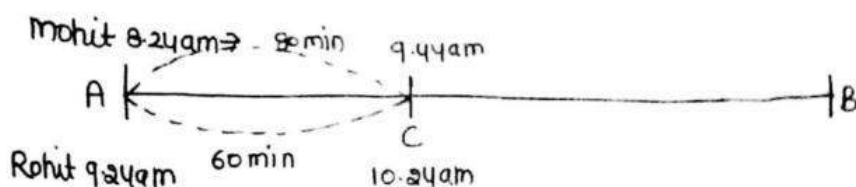
- 55 Two guns were fired from same place at an interval of 28 mins. But a man sitting in the train ~~approaching~~ going away from the place hears the 2nd firing 30 min after the 1st. If the speed of train is 20 km/Hr find the speed of sound?

	Time	speed
28	30 15	1 $\xrightarrow{\times 20}$ 20 km/Hr
30	2 1	15 $\xrightarrow{\times 20}$ 300 km/Hr
		Ans.

- 56 The buses are departed after every 20 min, but man going away from the bus depot after every 24 min get the buses. find the speed of buses if the speed of man is 30 km/Hr.

	T	S	same concept as gun.
20	24 6	6 $\xrightarrow{\quad}$ 30 km/Hr	
24	4 1	6 $\xrightarrow{\times 30}$ 180 km/Hr	Ans.

- 57 Two places A & B are 300 km apart, ~~2 men p & q~~ ^{mohit} starts from city A at 8:24 am and an hour later Rohit starts from city A & after travelling for one hour he reaches at city C that mohit had passed 40 min earlier. City C falls on the way from A to B. if they reaches city B at same time, find their speed.



	T	S
Mohit	$\frac{80}{3x}$	$\frac{75}{4x}$
Rohit	$\frac{60}{3}$	$\frac{4x}{4x}$

$$\frac{100}{3x} - \frac{75}{4x} = 1$$

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

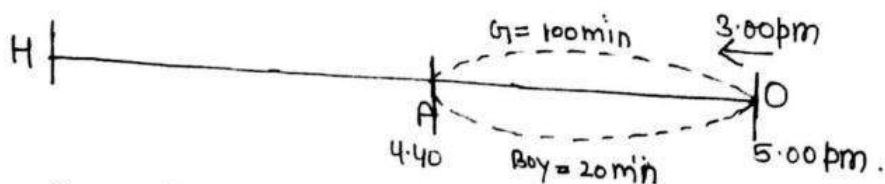
$$x = 25$$

$$\text{Mohit} = 3 \times 25 = 75 \text{ km/Hr}$$

$$\text{Rohit} = 4 \times 25 = 100 \text{ km/Hr}$$



- 58] A boy starts from his home at a certain time with a certain speed to pick up his girlfriend from office at 5:00 pm. One day his girlfriend left the office at 3:00 pm and start walking to home with a speed of 40 km/Hr and meet the boy in the way who left his home at his usual time. They reached home 40 min earlier than their usual time. find the speed of boy.



40 मिनट पहले
पहुंच गए घर

क्योंकि आज Boy को A से O और O से A नहीं जाना पड़ा
 $\therefore$ A से O & O से A आने जाने में 40 min लगे (20+20)
 $\therefore$ Hence they meet at 4:40 on the usual.

G	T	S	
	100 5	1	$\xrightarrow{\times 40} 40 \text{ km/Hr}$
B	200 1	5	$\xrightarrow{\times 40} 200 \text{ km/Hr}$

Ans.

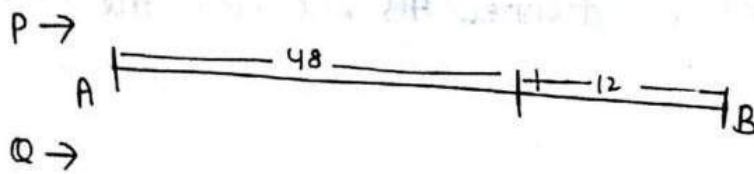
- 59] 2 places A and B are 60 km apart. 2 men P & Q start from A at same time & meet 1st time at a place 12 km from B & they have to reach at A after immediate return from B. If the speed of slower person is 48 km/Hr. find the diff of their speed?

If two or more objects starts at same time for a certain time then they travel the distance in the ratio of their speeds and vice-versa.

Eg:

A	B	
5 km/Hr	4 km/Hr	
3 Hr	3 Hr	Same ratio of speed & distance.
+ 5 km	+ 2 km	
5	4	

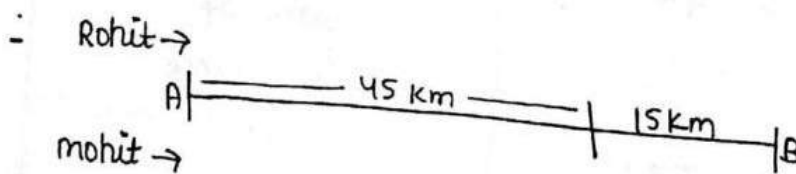




$P \quad Q$
 $48 \text{ km} : 72 \text{ km}$
 $D. \quad 2 : 3$
 $S : \quad 2 : 3$
 $\quad \quad \quad \times 24 \quad \quad \quad \times 24$
 $\quad \quad \quad 48 \text{ km/Hr} \quad \quad \quad 72 \text{ km/Hr}$

diff. b/w their speed = 24 km/Hr .

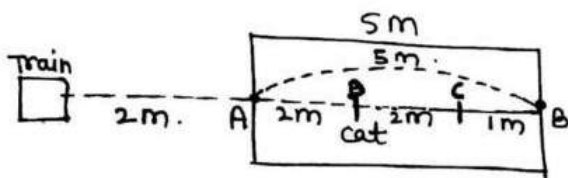
60 Rohit and mohit starts at same time from A to B, after reaching their destination they turned to their starting point and they meet 1st time at 15 km from B. If the diff b/w their speed is 60 km/Hr then find the speed of faster if A & B are 60 km apart?



$Rohit \quad Mohit$
 $45 \text{ km} : 75 \text{ km}$
 $D \quad 3 : 5$
 $S \quad 3 : 5$
 $\quad \quad \quad \times 30 \quad \quad \quad \times 30$
 $\quad \quad \quad 90 \text{ km/Hr} \quad \quad \quad 150 \text{ km/Hr}$
 $\quad \quad \quad \text{2 unit} \text{---} 60$
 $\quad \quad \quad 1 \text{---} 30$

Ans

- 61 A train approaches a tunnel AB, inside the tunnel a cat is located at a point ie $\frac{2}{5}$ the distance AB measure from the entrance. When the train whistle then cat run. If the cat decides to run towards A side the train catches the cat exactly at A. If the cat decides to run towards B side, the train catches the cat exactly at B. find ratio of speed of train & cat ?

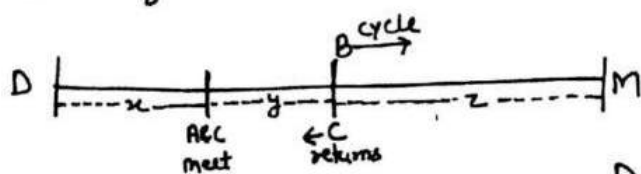


	Train	cat
Distance	5	3
speed	5	3



* cat is at point D. Train & A के बीच का distance 2m है. जब Train A point पर पहुंचेगी तो cat D से C पर पहुंच जायेगी. अब जितने time में train A से B 5m cover करती है उतने time में cat C से B 1m. $\therefore$ same time पे चले हैं, same time पर पहुंचे हैं. so जो distance travel करेंगे अपनी speed की ratio में करेंगे।

- 62 A, B, C travels a distance of 1200 km from Delhi to Mumbai. B & C takes a car & A starts with tonga and after a certain distance C throws B from car. B takes a cycle and C returns to take A and finally they reach Mumbai at same time. If the speed of car is 50 km/hr and of cycle & tonga is 10 km/h each. find the total time of journey.



जितने time में C (x+2y) distance cover करेगा उतने time में A (x) करेगा $\therefore$ दोनों जो distance cover करेंगे वो speed के ratio में करेंगे.

$$\frac{C}{A} = \frac{x+2y}{x} = \frac{50}{10}$$

$$\boxed{\frac{x}{y} = \frac{1}{2}}$$

$$\begin{array}{l} \text{C} \quad \frac{2y+z}{z} = \frac{50}{10} \\ \text{B} \end{array}$$

same case C और B का होगा.

$$\boxed{\frac{z}{y} = \frac{1}{2}}$$

$$\begin{array}{l} X : Y : Z \\ 1 : 2 : 1 \end{array}$$

$$\begin{array}{l} 1+2+1=4 \rightarrow 1200 \text{ Km} \\ 1 \text{ unit} \rightarrow 300 \text{ Km.} \end{array}$$

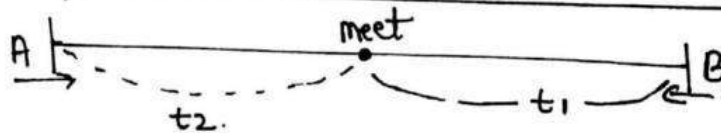
Time taken =

$$\frac{300}{10} + \frac{900}{50}$$

$$T = \frac{D}{S}$$

$$= 48 \text{ Hrs. } \underline{\underline{\text{Ans.}}}$$

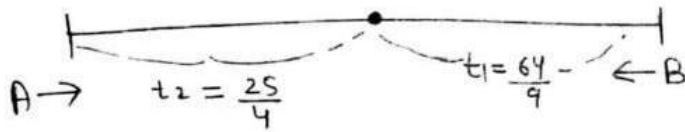
#



A & B starts walking towards each other
After meeting A cover his distance in t_1
time and B cover his distance in t_2 time
Ratio of their speed is

$$\frac{A}{B} = \sqrt{\frac{t_2}{t_1}}$$

- 63] 2 men A & B start from Delhi & Agra at same time towards each other, after meeting on the way they cover their remaining journey in $7\frac{1}{9}$ Hr & $6\frac{1}{4}$ Hr respectively. find the slower speed if faster speed is 40 km more than slower?



$$\frac{A}{B} = \sqrt{\frac{\frac{25}{4}}{\frac{64}{9}}} = \sqrt{\frac{25}{4} \times \frac{9}{64}} = \frac{15}{16}$$

$$\frac{A}{B} = \frac{15}{16} \rightarrow \text{1 unit} \times 40 = 40 \text{ km}$$

$$A = 15 \times 40 = 600 \text{ km/Hr}$$

$$B = 16 \times 40 = 640 \text{ km/Hr}$$

- 64] A distance of 600 km is to be covered in 2 parts. In 1st phase 120 km is travelled by train and rest by car and it took total of 8 Hr, but if 200 km is covered by train and rest by car it takes 20 min more. find the avg speed of car and train?

$$\frac{120}{T} + \frac{480}{C} = 8 \quad \text{--- (i)}$$

$$\frac{200}{T} + \frac{400}{C} = 8\frac{1}{3} \quad \text{--- (ii)}$$

Multiply (i) by 5 and (ii) by 3.

$$\frac{600}{T} + \frac{2400}{C} = 40$$

$$\frac{600}{T} + \frac{1200}{C} = 25$$

$$\frac{80 \times 1200}{C} = 15$$

$$C = 80 \text{ km/Hr}$$

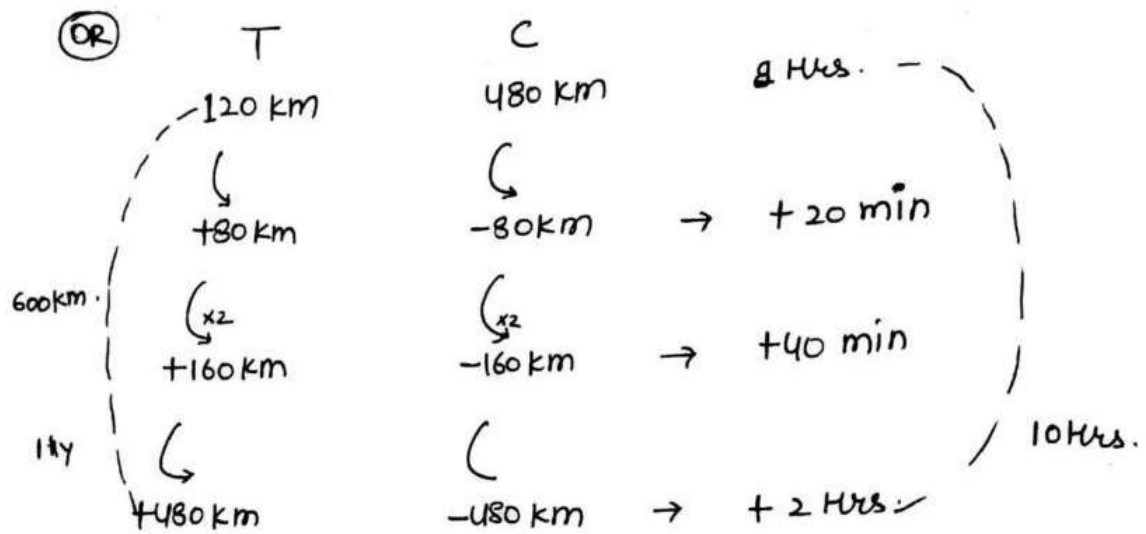
Put in (i)

$$\frac{120}{T} + \frac{480}{80} = 8$$

$$\frac{120}{T} = 8 - 6 = 2$$

$$T = \frac{120}{2} = 60$$

$$T = 60 \text{ km/Hr}$$



$$\text{speed of Train} = \frac{600}{10} = 60 \text{ km/Hr.}$$

$$\Rightarrow \begin{array}{l} \text{T} \\ \frac{120 \text{ km}}{60} \\ = 2 \text{ Hr} \end{array} \quad \begin{array}{l} \text{C} \\ \frac{480 \text{ km}}{6} \\ 80 \text{ km/Hr.} \\ \downarrow \\ \text{Car speed.} \end{array} \quad \begin{array}{l} 8 \text{ Hr} \\ \end{array}$$

Ans.

CLASS

11.

By Pardeep Chhoker
7206446517

- 65] A man takes 6.30 Hrs in walking to a certain distance and riding back on horse. If he rides both sides on horse he would have saved 2 Hrs 10 min. How much time does he take on walking both sides.

$$W + R = 6.30$$

$$R + R = 4.20$$

↓ ↓

$$2.10 \quad 2.10$$

$$50. \quad W + R = 6.30$$

↓
2.10

$$W = 4.20$$

$$W + W = 4.20 + 4.20 = 8.40 \text{ Hrs. } \underline{\underline{\text{Ans}}}$$



- 66] Without any stoppage a person travel a certain distance at an avg speed of 42 km/Hr and with stoppage it travel the same distance with 28 km/Hr avg speed. Find how many min per hour does he stop ?

$$\frac{42-28}{42} \times 60$$

$$\frac{14}{42} \times 60$$

$$3$$

$$= 20 \text{ min/hr.}$$

$$\left(\frac{\text{Faster Speed} - \text{Slower speed}}{\text{Faster speed}} \times 60 \right) \text{ min/hr}$$

- 67] Excluding stoppage the speed of bus is 54 km/hr 92
Including stoppage it is 45 km/hr. How many min does the bus stops per hour.

$$\frac{54-45}{54} \times 60$$

$$\frac{9}{54} \times 60 = 10 \text{ min/hr. } \underline{\text{Ans}}$$

- 68] A train covers a distance of 36 km with speed of 12 km/hr, if it stops 12 min after every 1 km. find the total time covered in distance by the train?

$$\frac{36}{12} = 3 \text{ hr.}$$

He stops 12 min after every 1 km.

∴ He stops 35 times.

$$\frac{35 \times 12}{60} = 7 \text{ hrs he stops.}$$

$$\text{Total time} = 3 + 7 = 10 \text{ Hrs.}$$



- 69] An express train travelled at 100 km/hr stopping for 3 min after every 75 km and a local train travelled at 50 km/hr stopping for 1 min after every 25 km. If both train starts together then how many kms did the local train travel in the time it took the express train to travel 600 km?

Express Train

93

$$\frac{600}{100} = 6 \text{ hr.}$$

$$\text{Stoppage Time} = \frac{600}{75} = 7 \text{ times} \quad (\text{8th time तो destination पर पहुंच जाती})$$

$$7 \text{ times} \times 3 \text{ min} = 21 \text{ min.}$$

$$\text{Total time taken by Express train} = 6 \text{ hr } 21 \text{ min}$$

Slower Train

50 km/hr & stops 2 min in every hr.

$$6 \text{ hr} + 6 \times 2 (12 \text{ min})$$



$$300 \text{ km (in 6 hr 12 min)}$$



$$\text{Time left} = 9 \text{ min} \Rightarrow \frac{50 \times \frac{9}{60}^3}{2} = 7.5 \text{ km.}$$

$$\text{Total distance covered by slower train} = 307.5 \text{ km.}$$

70 Speed of a steam engine is 24 km/hr without any wagon. The decrease in speed of engine is directly proportional to the square root of no. of wagons attached. if 4 wagons are attached with engine speed becomes 20 km/hr. find the max. no. of wagons which are attached with engine so that engine can carry.

$$\text{Decrease} \propto \sqrt{w}$$

$$D = K \sqrt{w}$$

$$24 - 20 = K \sqrt{4}$$

$$2 \times 4 = K \times 2$$

$$\boxed{K = 2}$$

$$\therefore D = 2\sqrt{w}$$

Train की speed zero

करने के लिए 24 decrease करेंगे

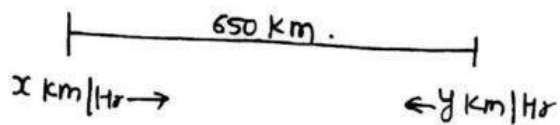
$$12 - 24 = 2\sqrt{w}$$

$$w = 144$$

144 wagon पे speed zero हो जायेगी means Train 143 wagon ले जा सकती है।

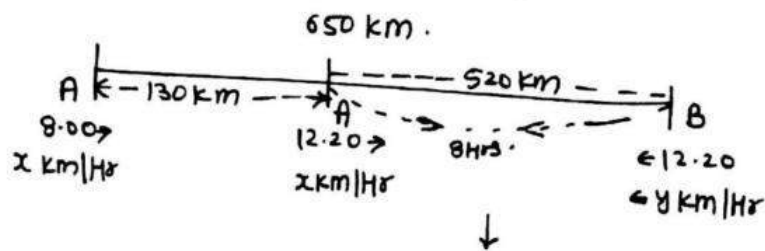
143 wagon Ans

[71] The distance b/w 2 stations X and Y is 650 km. if 2 trains start together at same time from both stations towards each other and meet after 10 hrs but if one train is started 4 hrs 20 min after the first then they meet after 8 hrs. find the speed of trains.



meeting time = 10 Hr.

$$\therefore \text{Relative speed } (x+y) = \frac{650}{10} = 65 \text{ km/Hr.}$$



meet time = 8 Hr.

$$D = ST = 65 \times 8 = 520 \text{ km.}$$

speed of A in covering 130 km in 4 hr 20 min

$$S = \frac{130}{\frac{10}{3}} \times 3 = 30 \text{ km/Hr.}$$

$$4 \frac{20}{60} = \frac{10}{3} \text{ Hr.}$$

Speed of Train A ($x \text{ km/Hr}$) = 30 km/Hr.

Speed of Train B ($y \text{ km/Hr}$) = $65 - 30 = 35 \text{ km/Hr.}$

Ans

- [72] A person travel 120 km by a steamer, 460 km by train & 60 km by Horse. The total journey took 13 Hr 30 min. If the rate of the train is 3 times that of horse and 1.5 times that of steamer. Find the speed of train.

$$\begin{array}{ccc} T & H & S \\ 3x & : & 1x & : & 2x \end{array}$$

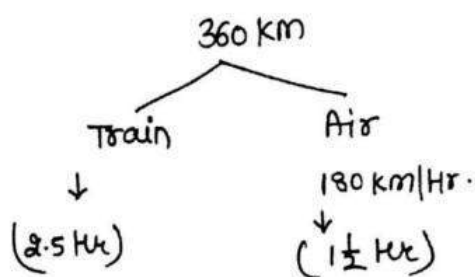
$$\frac{\frac{120}{3x}}{\frac{460}{x}} + \frac{60}{x} + \frac{60}{2x} = \frac{27}{2}$$

$$\frac{270}{x} = \frac{27}{2}$$

$$\boxed{x = 20}$$

$$\text{Speed of Train} = 3x = 3 \times 20 = 60 \text{ km/Hr.}$$

- [73] A man travel 360 km in 4 hrs partly by air and partly by train. If he had travelled all the way by air then he would have arrived 2 hrs earlier at his destination and save $\frac{4}{5}$ of the time he was in train. Find the distance travelled by air and train separately?



$$\text{By Air} = 180 \times \frac{3}{2} = 270 \text{ km}$$

$$\text{By Train} = 360 - 270 = 90 \text{ km}$$

Ans.

$$T + A = 4 \text{ hrs}$$

$$A = 4 - 2 = 2 \text{ hrs.}$$

$$\text{Speed in Air} = \frac{360 \text{ km}}{2 \text{ hrs}} = 180 \text{ km/Hr.}$$

$$* \text{ Train time} = t \text{ hour}$$

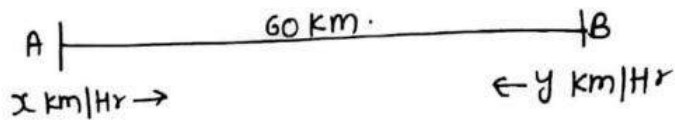
$$t \times \frac{4}{5} = 2$$

$$t = 2.5 \text{ Hr.}$$

$$\text{Air} = 4 - 2.5 = 1.5 \text{ Hr.}$$

2 Hr जल्दी पहुँचा है तो Train के time का $\frac{4}{5}$ save किया है।

- 74 From two places 60 km apart A & B starts towards each other at same time and meet each other after 6 hrs. if A travel $\frac{2}{3}$ of his speed and B travel with double of his speed then they would have met after 5 hrs. find the speed of A.



$$x + y = 10$$

$$\left(\frac{2x}{3} + 2y\right) = 12$$

$$\Rightarrow \cancel{x} + 3y = 18$$

$$\cancel{x} + y = 10$$

$$2y = 8$$

$$y = 4 \text{ km/hr}$$

$$x = 10 - 4 = 6$$

$$R \cdot S = \frac{d}{t}$$

$$= \frac{60}{6}$$

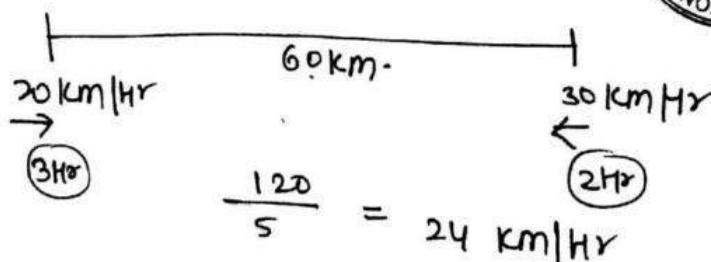
$$= 10$$

$$* \frac{60}{5} = 12$$

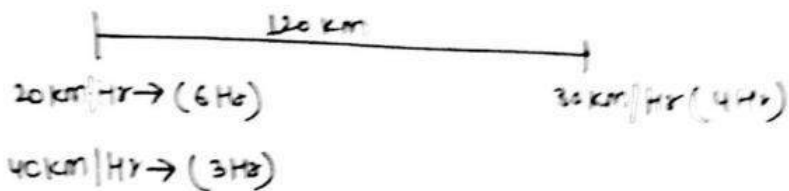
$$\therefore x = 6 \text{ km/hr}$$

- 75 A man travel from A to B at 20 km/hr. and come back from B to A at 30 km/hr. find the avg. speed of the whole journey.

$$\text{Avg speed} = \frac{\text{Total distance}}{\text{Total time}}$$



- 76] A man travel from A to B at 20 km/Hr and he come back from B to A at 30 km/Hr and he again travel from A to B at 40 km/Hr . find the avg speed of the whole journey?



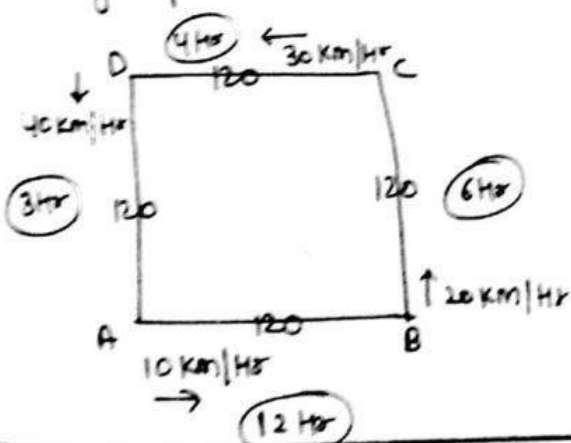
$$\text{Avg speed} = \frac{360}{13} \text{ km/Hr}$$



$$120 + 120 + 120 = 360$$

- 77] Four cities A, B, C & D are on the corners of a square. And the side of the square is 100 km.

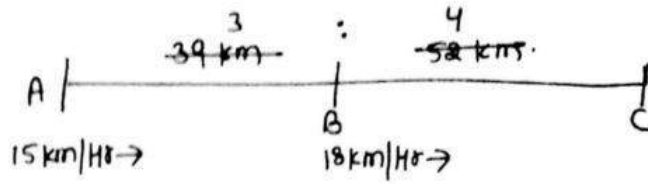
A man travel from A to B at 10 km/Hr , B to C @ 20 km/Hr , C to D @ 30 km/Hr and D to A @ 40 km/Hr . find the avg speed of the whole journey.



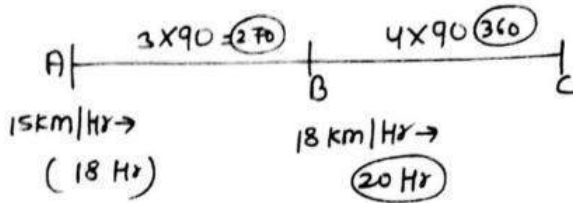
Avg. speed में सभी
दिशों से कोई भी distance
ले सकते हैं।

$$\frac{120 \times 4}{25} = \frac{96}{5} \text{ km/Hr}$$

- 78] A man travel from A to B a 39 km distance with a speed of 15 km/Hr and he travel from B to C 52 km distance with a speed of 18 km/Hr . find the avg speed of whole journey?



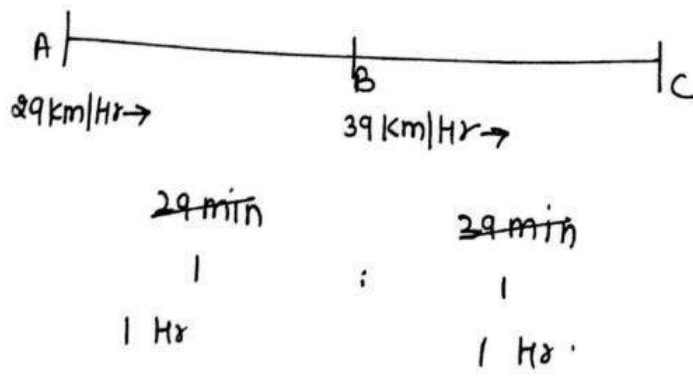
कोई भी distance ले सकते हैं but ratio same आना चाहिए distance का



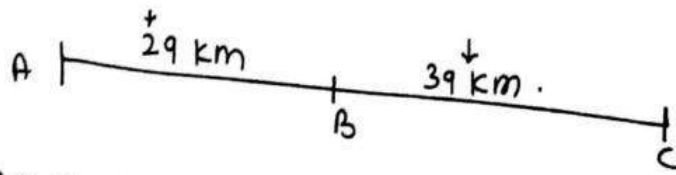
15 18
 90

$$\text{Avg speed} = \frac{270 + 360}{18 + 20} = \frac{630}{38} \text{ km/hr}$$

[79] A man travel from A to B at a speed of 29 km/hr in 29 min. and he travel a distance from B to C with a speed of 39 km/hr in 29 min. find the avg speed of whole journey.



कोई भी Time ले सकते हैं But original वाले time का जो ratio है वही हमारा होना चाहिए.



$$\text{Avg speed} = \frac{29 + 39}{1 + 1} = \frac{68}{2} = 34 \text{ km/hr}$$

80

A gives B a start of 5 sec. in 1000 m race. But both finish the race at same time. find the time taken by A to finish the race. If speed of B is 5 m/sec.

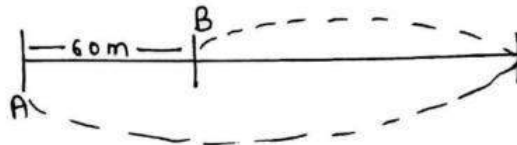
$$B = \frac{1000}{5} = 200 \text{ sec.}$$

$$\begin{array}{r} B \quad \text{200 sec.} \quad B \\ A \quad \underline{A = 200} \\ \quad \quad \quad - 5 \\ \quad \quad \quad \hline \quad \quad \quad 195 \text{ sec.} \\ \quad \quad \quad \underline{\quad \quad \quad} \quad \underline{\text{Ans}} \end{array}$$

81

A is $1\frac{2}{3}$ times faster than B. A gives 60 m start to B in a race. find the length of race if both finish the race at same time.

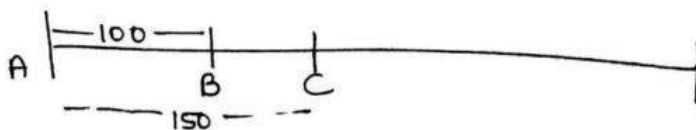
$$\begin{array}{lcl} A & : & B \\ \text{Speed} \rightarrow & 5x & : & 3x \\ \text{distance} & 5x & : & 3x \\ & \xrightarrow{2x} & 60 \\ & x = 30 \end{array}$$



$$\text{Race track} = 5x = 150 \text{ mt.}$$

82

In a 1000 m race A gives a start of 100 m to B & 150 m to C. How much start B can give to C in a race of 1000 m.

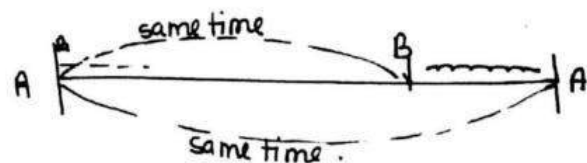


	A	B	C
D →	1000	900	850
		50	

if 900 mt race B to C a start of — 50 mt
 " " " " — $\frac{50}{900}$
 1000 mt " " " = $\frac{50}{900} \times 1000$
 = $55 \frac{5}{9}$ m Ans

- 83] A can finish a race in 3 min, 10 sec. while B can finish the same race in 3 min 20 sec. By what distance A will defeat B in a race of 1000 m.

	A	:	B
Time	190	:	200
Speed	20	:	19
	$\times 50 \downarrow$		$\downarrow \times 50$
	1000		950
	50 mt.		<u>Ans.</u>

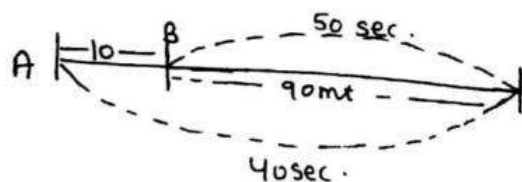


Same Time पर चले हैं और same time के लिए दौड़े हैं तो speed के ratio में distance cover करेंगे.

- 84] In a 100 m race A runs at a speed of 9 km/hr. He gives a start of 10 m to B and still defeat him by 10 sec. find speed of B.

$$9 \text{ km/hr} \times \frac{5}{18} = \frac{5}{2} \text{ m/s}$$

$$A = \frac{100 \times 2}{5} = 40 \text{ sec.}$$



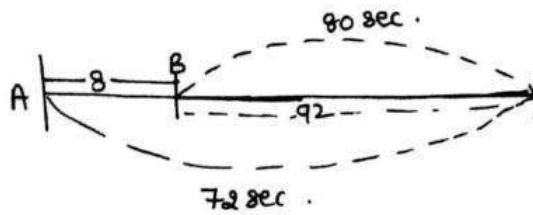
B cover 90 mt in 50 sec.

$$\text{Speed}_B = \frac{90}{50} = \frac{9}{5} \text{ m/s.}$$

- 85] In a 100 m race A runs at a speed of 5 km/hr. He gives a start of 8 m to B and still defeat him by 8 sec. find speed of B ?

$$A = 5 \times \frac{5}{18} = \frac{25}{18} \text{ m/s.}$$

$$A = \frac{4}{\frac{100 \times 18}{25}} = 72 \text{ sec.}$$



B will cover 92 m in 80 sec.

$$S = \frac{92}{80} = \frac{23}{20} \text{ m/sec. } \underline{\underline{\text{Ans.}}}$$

