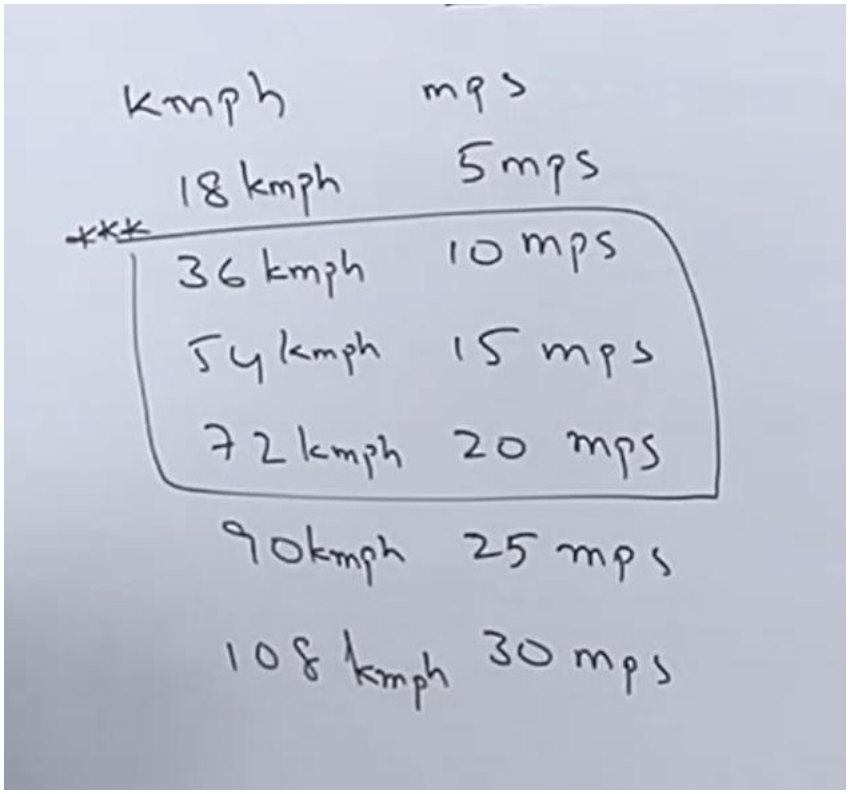
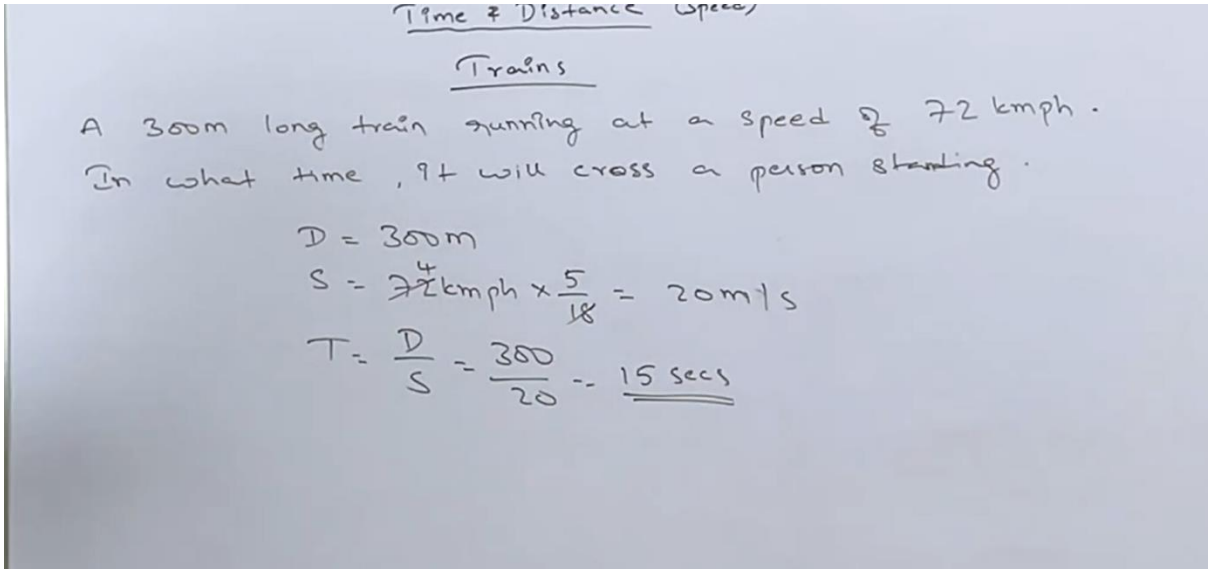
TIME AND DISTANCE





Time & Distance

Trains

A 150m long train running at a speed of 54 kmph. In what time, it will cross a platform of length 600 m.

$D = 150m + 600m = 750m$

$S = 54 \text{ kmph} \times \frac{5}{18} = 15 \text{ mps}$

$T = \frac{750}{15} = 50 \text{ secs}$

Trains

A train of length 350m crosses a platform of length 420 m in 77 secs. What is the speed of the train in kmph.

Distance $= 350 + 420 = 770m$

Time $= 77$ secs

$\text{Speed} = \frac{D}{T} = \frac{770}{77} = 10 \text{ mps} \times \frac{18}{5} = 36 \text{ kmph}$

Trains

A 300m long train is running at a speed of 43 kmph. In what time, it will cross another train of length 600 m running in opposite direction at a speed of 47 kmph ?

Addition

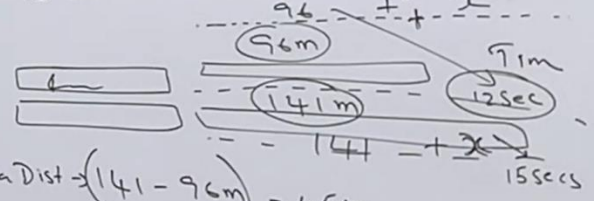
Sol :- Distance = 300 + 600 = 900 m

R. Speed = 43 + 47 = 90 kmph $\times \frac{5}{18}$ = 25 mps

Time = $\frac{D}{S} = \frac{900}{25}$ = 36 Secs

Trains

A train travelling at a constant speed crosses a 96 m long platform in 12 secs & another 141 m long platform in 15 secs. Find the length of the Train.



Distance = S × T

= 15 × 12

= 180 m

Length of Train = 180 - 96

= 84 mts

Extra Dist = (141 - 96m) = 45 m

Extra Time — 15 - 12 = 3secs

$S = \frac{D}{T} = \frac{ED}{ET} = \frac{45}{3}$ = 15 mps

Trains

A train travelling at a constant speed crosses a 120 m long platform in 15 secs & another 164 m long platform in 19 secs. Find the length of the Train.

Extra Dist = 164 − 120 = 44 m

Extra Time = 19 − 15 = 4 secs

Speed = $D/T = 44/4 = 11$ m/s

$D = S \times T$

$= 11 \times 15$

$= 165$ m

$L = 165 - 120$

$= 45$ m

CREATE U APTITUDE (in Telugu)

Time & Distance

(Q) Train A starts from Hyd to Chennai at 5:30 Am with an avg speed of 75 kmph. Another train started from Chennai to Hyd at 5:30 Am with an avg speed of 85 kmph. If the distance b/w Hyd & Chennai is 800 km Find

(1) At what time (10:30 Am) they meet ? Time = $\frac{\text{Dist}}{\text{Speed}} = \frac{800}{75+85} = \frac{800}{160} = 5$ hrs

(2) At what distance from Hyd they meet ? $D = S \times T$

$= 75 \times 5 = 375$ km

5:30 + 5 = 10:30 Am

(3) At what distance from Chennai they meet ?

$D = S \times T = 85 \times 5 = 425$ km

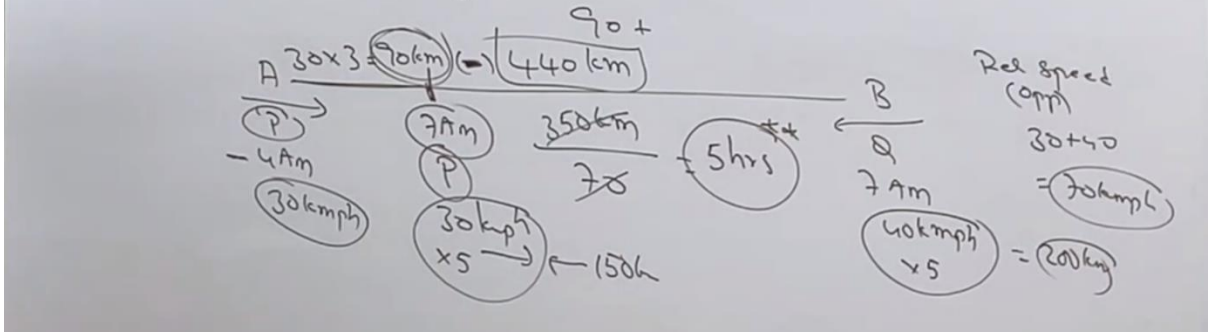
Time & Distance

The distance b/w A & B is 440 km. 'P' starts from 'A' at a speed of 30 kmph at 4 Am towards B. 'Q' starts from B at a speed of 40 kmph at 7 Am towards A.

(1) Find at what time they meet? 7 Am + 5 hrs = 12:00 pm

(2) At what distance from 'A' they meet? 440 km − 200 km = 240 km

(3) At what distance from 'B' they meet? 40 kmph × 5 = 200 km



Time & Distance

Rajadhani Express started from Delhi to Mumbai at 14:30, travelling at a speed of 60 kmph. Durranto Express started from Delhi to Mumbai at 16:30, travelling at a speed of 80 kmph. How far away from Delhi do they meet?

Time ?

R.E → 14:30 at 60 kmph →

D.E → 16:30 at 80 kmph →

R.S = 80 − 60 = 20 kmph (S)

16:30 + 6 hrs

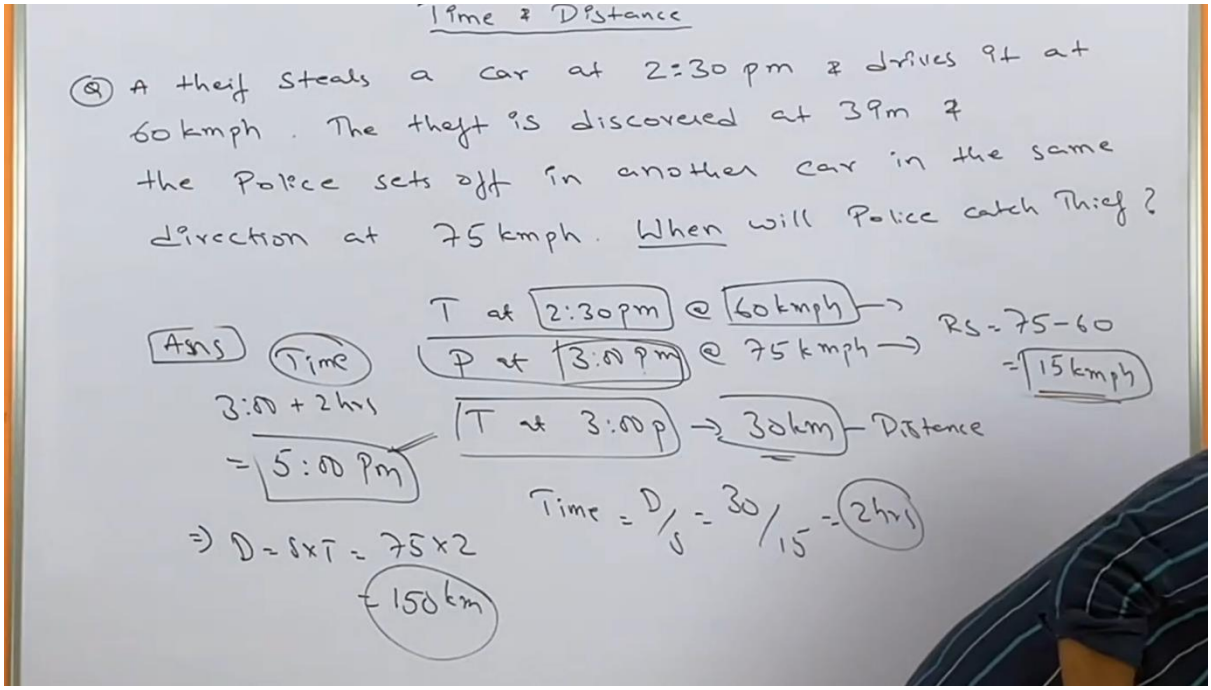
⇒ 22:30

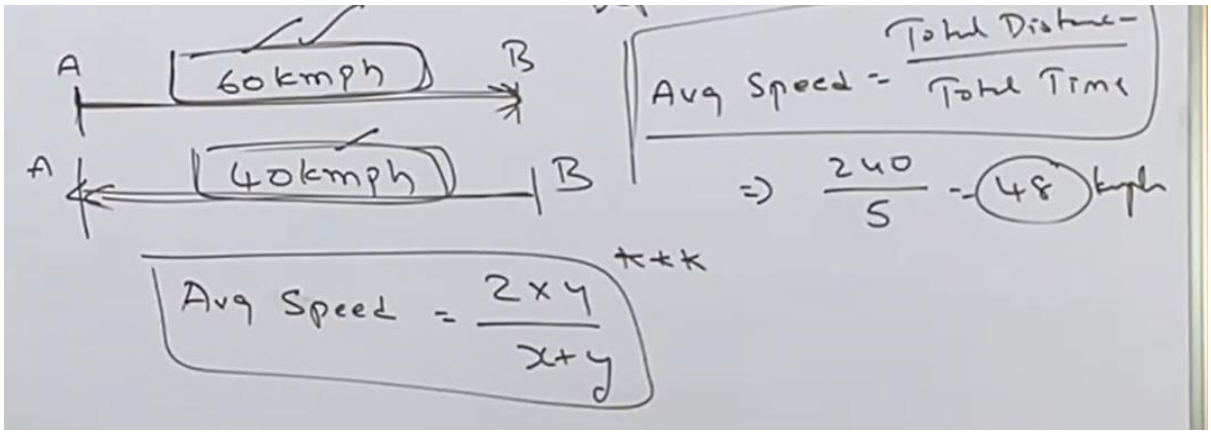
R.E → 60 × 2 = 120 km (D) at 16:30

Distance from Delhi

Time = D/S = 120/20 = 6 hrs

⇒ S × T = 80 × 6 = 480 km





->Only two sppeds given

Average Speed

I have to cover a distance of 240 km. Of which, $\frac{1}{4}$th of the distance at 30 kmph, $\frac{1}{3}$rd of the distance at 40 kmph & the remaining at a speed of 50 kmph. What is my average speed?

30 + 40 + 50 / 3 = 40 kmph

	Dist	Speed	Time
$\frac{1}{4} \times 240$	60 km	30 kmph	$\frac{60}{30}$ = 2 hrs
$\frac{1}{3} \times 240$	80 km	40 kmph	$\frac{80}{40}$ = 2 hrs
Rem = 240 − (60 + 80) = 240 − 140 =	100 km	50 kmph	$\frac{100}{50}$ = 2 hrs

Total Distance = 240 km

Total Time = 6 hrs

Avg = $\frac{TD}{TT} = \frac{240}{6}$ = 40 kmph

Time & Distance

***

The avg speed of a Train including stoppages is 25 kmph. Excluding stoppages, it is 40 kmph. How many minutes per hour did the train stop?

$$\frac{\text{Dif}}{\text{Excl Stop}} \times 60 = \frac{40 - 25}{40} \times 60 \Rightarrow \frac{\text{Dif}}{\text{Larger No}} \times 60$$

$$= \frac{15}{40} \times 60 = \frac{45}{2} = 22.5 \text{ mins}$$

Time & Distance

A man takes 5h 45m in walking to a certain place & riding back. He would have gained 2 hrs by riding both the ways. The time he would have taken walking both the ways ?

⇒ 5 hrs 45 m + 2 hrs = 7 hrs 45 mins

W + R = 5hr 45m

R + R = 3hr 45m

⇒ R = 3hrs 45m / 2 = 225m / 2 = 112.5m

W + R = 345 m

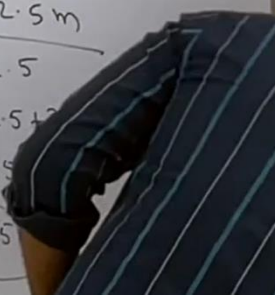
R = 112.5 m

W = 232.5

W + W = 232.5 + 232.5

W + W = 465

= 7hrs 45



Time & Distance

Walking at 5/6 th of his usual speed, a man is 10 mins late. The usual time taken by him to cover the distance is ?

Speed → 5 — New speed

6 — Usual speed

⇒ Time → 6 — New Time

5 — Usual Time — 10 mins

1 —(×10)— 10 mins

5 —(×10)— 50 mins

$S \propto \frac{1}{T}$

S ↑ T ↓

S ↓ T ↑

Walking at 11/9 th of his usual speed, a man is 1 hr 39 min Early. The usual time taken by him to cover the distance is ?

Speed: 11 — New Speed; 9 — Usual Speed

Time: 9 — New Time; 11 — Usual Time } 2 — 1 Hr 39 m

×49.5

⇒ 2 — 99 m

11 — ?

11 × 49.5

544.5 m → 9 hrs 45 m

A boy goes to school from his village at a speed of 3 kmph. He returns to his village from school at a speed of 2 kmph. If he spends 5 hrs in the journey, find the Distance b/w his school & village ?

Total Distance = Avg Speed × Total Time

$= \frac{2xy}{x+y} \times 5$ / 2 $= \frac{xy}{x+y} \times$ Time

$= \frac{2 \times 3 \times 2}{3+2} \times 5$

$= \frac{2 \times 3 \times 2}{5} \times 5 \Rightarrow 12$ kms / 2 = 6 km

Avg $= \frac{2xy}{x+y}$

$= 2x$

$= \frac{P}{S} \times T.T$

$= \frac{3 \times 2}{5} \times 5 = 6$ km

A boy goes to school from his village at a speed of 3 kmph. He returns to his village from school at a speed of 2 kmph. If he spends 30 min in the journey, find the Distance b/w his school & village?

$$\frac{P}{S} \times \frac{T.T(\text{mins})}{60} \quad \frac{3 \times x}{5} \times \frac{30}{60 x} = \frac{3}{5} \text{ km}$$

A boy goes to school from his village at a speed of 30 kmph and he is late to his school by 10 mins. Next day, he travelled at a speed of 40 kmph and reached his School 5 min early. What is the distance b/w his school & Village.

L – L

E – E

70 min
− 55 min
15 mins

L + E

E & L Dif

(+)

5 − (−10)
= 5 + 10
= 15 m

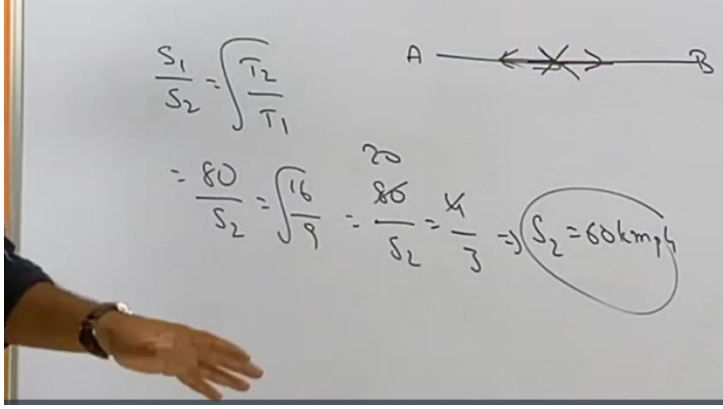
$$\text{Distance} = \frac{\text{Prod}}{\text{Dif}} \times \frac{\text{Time Dif (min)}}{60}$$

$$= \frac{30 \times 40}{40 - 30} \times \frac{15}{60}$$

$$= \frac{30 \times 40}{10} \times \frac{15}{60} = 30 \text{ km}$$

Time & Distance

Two Trains, one from Hyd to Chennai and another from Chennai to Hyd start simultaneously. After they meet, the trains reach their destinations in 9 hours & 16 hours respectively. If the speed of the first train is 80kmph, find the speed of the second train.



$$\frac{S_1}{S_2} = \sqrt{\frac{T_2}{T_1}}$$

$$\frac{80}{S_2} = \sqrt{\frac{16}{9}} = \frac{80^{20}}{S_2} = \frac{4}{3} \Rightarrow S_2 = 60\text{kmph}$$

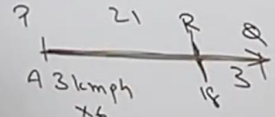
$$\frac{S_1}{S_2} = \sqrt{\frac{T_2}{T_1}}$$

$$\frac{80}{S_2} = \sqrt{\frac{16}{9}} = \frac{80^{20}}{S_2} = \frac{4}{3}$$

$$\Rightarrow S_2 = 60\text{kmph}$$

Time & Distance

Two persons A & B, walk from P to Q, which are at a distance of 21 km, at 3 kmph (A) & 4 kmph (B) respectively. B reaches Q & returns immediately and meets A at R. Find the distance from P to R.



A: 3kmph × 6 = 18km

B = 4 × 6 = 24km

$21 \times 2 = 42\text{km}$

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

$42 \div 7 = 6\text{hrs}$

$3 \times 6 = 18\text{km}$

Sound Travels 330 mts per second. If the sound of a thunder cloud follows the flash after 10 seconds. The thunder cloud is at a distance of how many kms ?

Distance = Speed x Time

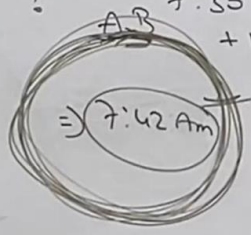
= 330 m x 10 sec

= 3300 m

= 3.3 km

Time & Distance

A walks around a circular field at a rate of (1 Round per hour, while the B runs around it at a rate of (6 rounds) per hour. They start in the same direction from the same point at 7:30 Am. They shall first cross each other at ?



R.S = Same

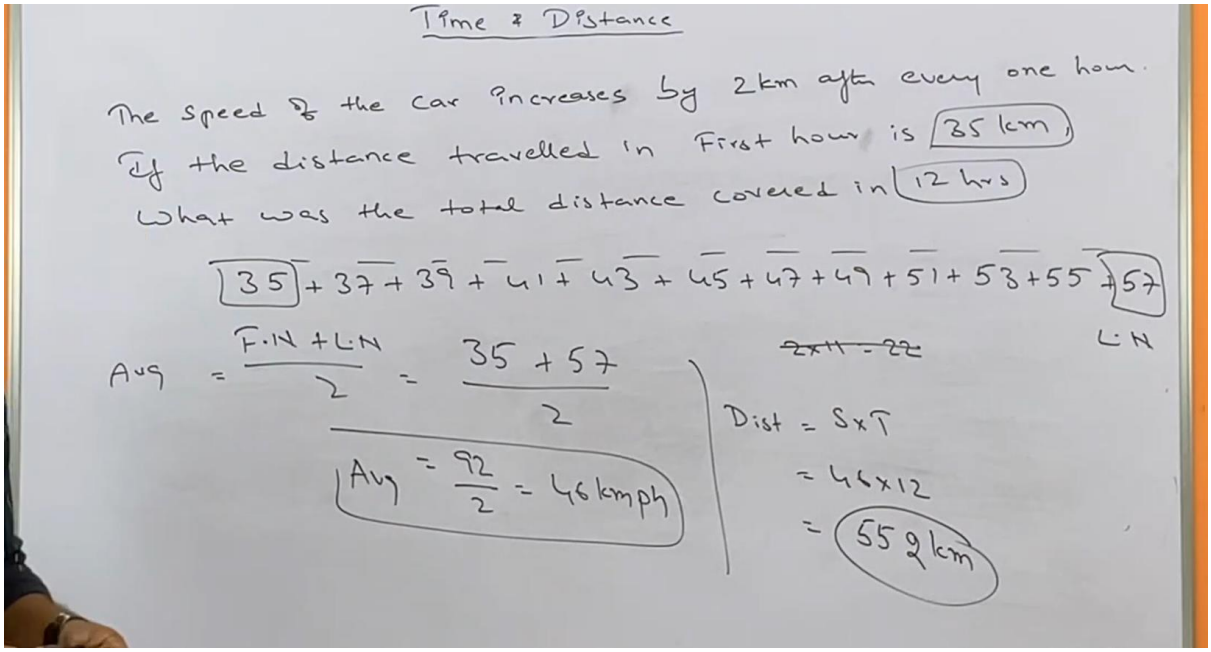
(−)

= 6R − 1R

⇒ 5 Rounds per hour

1 / 5R = 1 Round per 12m

12


Time & Distance
The speed of the car increases by 2km after every one hour.
If the distance travelled in First hour is 35 km,
What was the total distance covered in 12 hrs
35 + 37 + 39 + 41 + 43 + 45 + 47 + 49 + 51 + 53 + 55 + 57
F.N
L.N
Avg = F.N + L.N / 2 = 35 + 57 / 2
Avg = 92/2 = 46 kmph
Dist = S x T
= 46 x 12
= 552 km