- age
- Average
- Compound Interest
- HCF & LCM
- Numbers
- PARTNERSHIP
- Percentage
- Profit and Loss
- Ratio and Proportion
- Simple Interest
- Simplification
- Statics
- Time and Work

Time and Distance

1. $\text{Speed} = \left(\frac{\text{Distance}}{\text{Time}}\right)$, $\text{Time} = \left(\frac{\text{Distance}}{\text{Speed}}\right)$, $\text{Distance} = (\text{Speed} \times \text{Time})$

2. x km/hr $= \left(x \times \frac{5}{18}\right)$ m/sec

3. x m/sec $= \left(x \times \frac{18}{5}\right)$ km/hr

4. If the ratio of the speeds of A and B is $a : b$, then the ratio of the times taken by them to cover the same distance is $\frac{1}{a} : \frac{1}{b}$ or $b : a$.

5. Suppose a man covers a certain distance at x km/hr and an equal distance at y km/hr. Then, the average speed during the whole journey is $\left(\frac{2xy}{x+y}\right)$ km/hr.

How many minutes does Aditya take to cover a distance of 400 m, if he runs at a speed of 20 km/hr ? (Bank P.O. 2000)

Now we convert Aditys speed in km/hr to m/s.

Aditys speed in m/s = $20 \times \frac{5}{18} = \frac{50}{9}$ m/s

∴ Now we found time taken to cover distance of 400 m

$\Rightarrow$ time = $\frac{\text{Distance}}{\text{Speed}}$

$\Rightarrow \frac{400}{\frac{50}{9}} \Rightarrow \frac{400}{50} \times 9 = 72$ sec.

$\Rightarrow 60 + 12 \Rightarrow 1$ min 12 sec $\Rightarrow 1\frac{12}{60} \Rightarrow 1\frac{1}{5}$ min

km → m, hr → s

A car covers 125 km in 5 h, then find the speed of the car (2-3)

As per the given question.

A car covers 125 km in 5 h

we know that Speed = $\frac{\text{Distance}}{\text{time}}$.

∴ Required Speed = $\frac{125}{5} = 25$ km/hr.

m/s

A cyclist covers a distance of 750 m in 2 min 30 sec. What is the speed in km/hr of the cyclist ? (R.R.B. 2002) (7-3)

According to the question

A cyclist covers a distance of 750 m in 2 min 30 sec.

m → s

Now we convert 2 min 30 sec

∴ 2 min 30 sec = 60 + 60 + 30 = 150 sec

∴ The Speed of the cyclist = $\frac{750 \text{ m}}{150 \text{ s}} = 5$ m/s

$\Rightarrow$ Speed = $\frac{\text{Distance}}{\text{time}}$ =

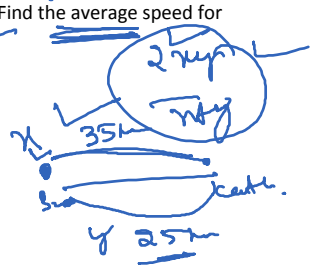
Now we Convert the Speed into km/hr.

km → m, s → hr

$\Rightarrow$ 5 m/s = $5 \times \frac{18}{5}$ km/hr.

$\Rightarrow$ 18 km/hr.

Manoj covers a certain distance by car driving at 35 km/h and he returns back to the starting point riding on a scooter with a speed of 25 km/h. Find the average speed for the whole journey



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

x 35km

Sun Earth.

y 25km

Q. According to the question.
Manoj cover a certain distance by a car at (x) = 35 km/hr.
then he return back to the same place at the speed of y = 25 km/hr.

Now we found the average speed of the Manoj → ~~2xy~~

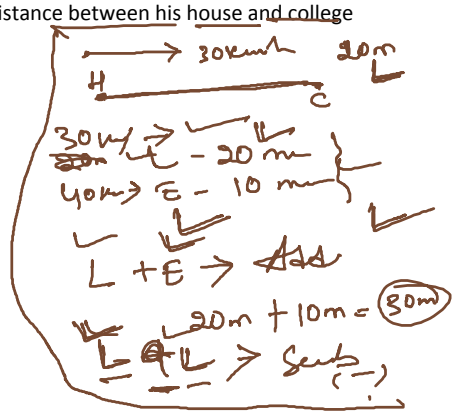
we ~~fo~~ apply the formula → $\frac{2xy}{x+y}$

$\Rightarrow \frac{2 \times 35 \times 25}{25+35} = \frac{70 \times 25}{60}$

$\Rightarrow$ 29.16 km/hr.

∴ The average speed of manoj is 29.16 km/h

Aashutosh covers a certain distance between his home and college by cycle. Having an average speed of 30 km/h, he is late by 20 min. However, with a speed of 40 km/h, he reaches his college 10 min earlier. Find the distance between his house and college



→ 30km/h 20m

H C

30km/h → L - 20 min

40km → E - 10 min

L + E → Add

20m + 10m = 30m

L + L → Sub (-)

According to the question

~~Let the distance be x km~~

→ Aashutosh move at speed of 30 km/h and reaches his college at late by 20 min.

30 km/h and reaches his college at late by 20 min.

but he move at 40 km/h he reaches at 10 min late.

Let the distance is x km

Difference bet^n the time taken

$= 20+10 = 30$ min $= \frac{30}{60} = \frac{1}{2}$

According to the gen.

$\Rightarrow \frac{x}{30} - \frac{x}{40} = \frac{1}{2}$

$\Rightarrow \frac{40x - 30x}{\cancel{1200}\,600} = \frac{1}{\cancel{2}} \Rightarrow \frac{10x}{600} = 1$

$\Rightarrow x = 60$ km

∴ The distance bet^n home to college is 60 km

A boy walking at a speed of 20 km/h reaches his school 30 min late. Next time he increases his speed by 4 km/h but still he is late by 10 min. Find the distance of the school from his home

20 km → 20 km

H S

20 km/h → 30 km

20+4 km → 24 km → 10 min

L − L = Same

30 − 10 = 20

As per the given question.

A boy walking at a speed of 20 km/h reaches his school at 30 min late

then he increases his speed of 4 km/h but still late by 10 min.

Let the distance be x km.

∴ Difference bet^n in time = 30 − 10 = 20 m

$= \frac{20}{60} = \frac{1}{3}$ hr.

... speed up his

$= \frac{20}{60} = \frac{1}{3}$ hr.

As per question second he speed up his journey = 20 + 4 = 24 km/hr

According to the question

$\Rightarrow \frac{x}{20} - \frac{x}{24} = \frac{1}{3}$

$\Rightarrow \frac{6x - 5x}{120} = \frac{1}{3} = \frac{x}{120} = \frac{1}{3}$

$x = 40$ km

∴ The distance between his house to his school is 40 km

A farmer travelled a distance of 61 km in 9 hours. He travelled partly on foot @ 4 km/hr and partly on bicycle @ 9 km/hr. The distance travelled on foot is :

According to the question

A farmer travelled a distance of 61 km in 9 hr.

He travel on foot @ 4 km/hr

& travel on bicycle @ 9 km/hr.

Let the distance travelled on foot be x km

The distance travelled on bicycle $(61 - x)$

According to the question

$\Rightarrow \frac{x}{4} + \frac{61 - x}{9} = 9$

$\Rightarrow \frac{9x + 4(61 - x)}{36} = 9$

$\Rightarrow 9x + 244 - 4x = 36 \times 9 = 324$

$\Rightarrow 5x = 324 - 244$

$\Rightarrow 5x = 80 \Rightarrow x = \frac{80}{5} = 16$ km

∴ The travel on foot of 16 km

A bus travels at the rate of 54 km/h without stoppages and it travels at 45 km/h with stoppages. How many minutes does the bus stop on an average per hour

A bus travels at the rate of 54 km/h without stoppages and it travels at 45 km/h with stoppages. How many minutes does the bus stop on an average per hour

As per the given question

A bus travels at 54 km/h without stoppages.

& with stoppages his speed is 45 km

Due to stoppages, bus covers 9 km less per hour.

time taken to cover 9 km

$\Rightarrow \frac{9}{54} \times 60 = 10$ min

∴ Here, the best time taken at the stoppages is 10 min

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

$= \frac{9}{54} \times 60 = 10$

In covering a certain distance, the speeds of A and B are in the ratio of 3 : 4. A takes 30 minutes more than B to reach the destination. The time taken by A to reach the destination is : (S.S.C. 1999)

A →

According to the question

the ratio of speeds of A & B is $= \frac{3}{4}$

Suppose A takes $4x$ hr & B takes $3x$ h to reach the destination.

the ratio of time taken by A : B $= \frac{4}{3}$

According to question

$\Rightarrow 4x - 3x = \frac{30}{60} = \frac{1}{2}$

$\Rightarrow x = \frac{1}{2}$

∴ Time taken by A

$\frac{1200}{3} = 400$

$\frac{1200}{4} = 300$

Ratio $\frac{A}{B} = \frac{400}{300}$

∴ Time taken by A

$= 4x \Rightarrow 4x\frac{1}{2} = 2$ hrs

$\Rightarrow$ is 2 hrs