

Speed  
Distance  
Time

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

$$\text{Speed} = \text{Distance} / \text{Time}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Time} = D / S$$

### Different Problem

Same distance

Same speed

Same Time

$$\text{Average speed} = \frac{TD}{T_1}$$

- 1.) A boy increases his speed to  $9/5$  times of original speed. By this he reaches his school 30 minutes before usual time. How much time he usually takes

Here we have Same D  
 $D = ST$

$$S_1 \times T_1 = S_2 \times T_2$$

$$8 \times T = \frac{9}{5} \times (T - 30)$$

$$5T = 9T - 270$$

$$T = 67.5 \text{ min}$$



- 2.) Ramesh sees a thief at a distance of 80m. Ramesh starts chasing thief who is running at speed of 5m/s. Ramesh runs at 7m/s. How much distance does he cover?

only Time is same as both start running. Ramesh needs to cover 80m so

$$\begin{aligned} T_R &= T_T \\ \frac{D_R}{S_R} &= \frac{D_T}{S_T} \end{aligned}$$

$$\frac{80+D}{7} = \frac{D}{5} \quad \Rightarrow D = 200m //$$

- 3.) P, Q, R are in cycle race of 4500. P cycles twice as fast as Q. R cycles 1/3rd as fast as Q. R completes the race in 15 minutes. Then where was Q from finish line when P finishes?

$$\begin{aligned} P &= 2Q \\ S_P &= 2S_Q \end{aligned}$$

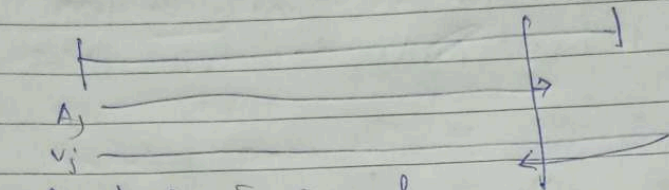
$$Q = \frac{1}{2} P$$

$$P = 4500m$$

$$Q = 2250m$$



- 4.) Ajay and Vijay travel from A to B at 17 km/hr and 19 km/hr respectively. A is 71 km from B. Vijay reaches B first and returns immediately and meets Ajay. find B to A distance.



only time is same  $t_A = t_V$

$$t_A = t_V$$

$$\frac{D_A}{S_A} = \frac{D_V}{S_V} \Rightarrow \frac{71-x}{17} = \frac{71+x}{19} \quad x=4$$

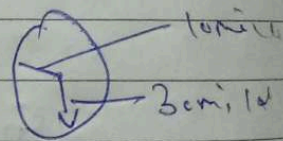
- 5.) Swender travels for  $x=10$  km from home to office by car. with any speed of 50 km/hr he is late by 30 minutes. But when he comes with a speed of 60 km/hr reaches 10 min ahead. How far is his office.

1 method

$$T_1 - T_2 = 40$$

$$\frac{D_1}{S_1} = \frac{D_2}{S_2} = 40$$

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



Total 40



B. at 12  
7.1 from  
m  
ind

$$2.) \quad D = S \times T$$

$$50 \left( \frac{x+30}{60} \right) = 60 \left( \frac{x-10}{60} \right)$$

$$5 \left( \frac{60x+30}{60} \right) = 6 \left( \frac{60x-10}{60} \right)$$

$$x = 7/2 \text{ hrs}$$

Then

$$D = 50 \left( \frac{7 + \frac{30}{60}}{2} \right) \quad D = 700 \text{ km}$$

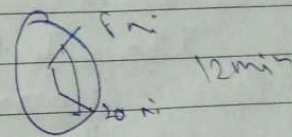
- 6) Rohit drives from his home at a speed of 30 km/h reaches his bank 20 minutes late. next day he increases his speed by 15 km/h. but still 8 min delay. How far his bank

$$20 - 8 = 12 \text{ min}$$

$$T_1 - T_2 = 12 \text{ min}$$

$$\frac{D}{30} - \frac{D}{45} = \frac{12}{60}$$

$$D = 18 \text{ km}$$



- 7) Prathik travels 96 km at speed of 16 km/h using a bike, 144 km at 31 km/h by car and another 108 km at 7 km/h in horse cart. Then find his avg speed for entire distance travelled



$$\text{Avg} = \frac{T.D}{T.T} = \frac{965 \text{ km} + 1105}{7.7} = 375 \text{ km/s}$$

$$\text{Total Time} = \frac{D}{S} = \frac{96}{5} + \frac{12}{3} + \frac{105}{7} = 15 \text{ hrs}$$

$$\text{Avg} = \frac{T.D}{T.T} = \frac{315}{2.5} = 126 \text{ km/hr}$$

8.) Rohit covers one-fourth of total distance at 20 km/hr, one-fourth at 10 km/hr and rest of his journey at 80 km/hr. find Rohit avg speed

$$\frac{D}{4} = 20 \text{ km/hr}, \quad \frac{D}{4} = 10 \text{ km/hr}, \quad \frac{D-D-D}{2} = \frac{D}{2} = 80 \text{ km/hr}$$

$$T.T = T_1 + T_2 + T_3$$

$$\frac{D/4}{20} + \frac{D/4}{10} + \frac{D/2}{80}$$

$$\frac{7D}{160}$$

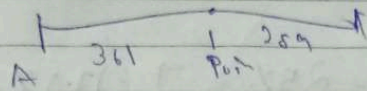
$$\text{Avg} = \frac{D}{\frac{7D}{160}} = \frac{160}{7}$$

9.) A w same to Jan journey ratio

10.)



- 9.) A walks from Jammu and Delhi and at same time B starts walking from Delhi to Jammu. After passing each other their journey in 361 hrs and 289 hours. Find ratio of speed of A to B



after reaching this pt.

$$S_A : S_B = \sqrt{t_B} : \sqrt{t_A}$$

$$\frac{S_A}{S_B} = \frac{\sqrt{289}}{\sqrt{361}} = \frac{17}{19}$$

- 10.) A car travelling with  $\frac{5}{7}^{\text{th}}$  of its actual speed covers 42 km in 1 hr 40 min. 48 sec. Find actual speed of car

$$\text{speed } \frac{D}{T} = \frac{5}{7} S$$

Given

1 hr 40 min

$$60 \times 60 + 40 \times 60 + 48$$

6048 sec

also convert km - m

$$42 \rightarrow 42000 \text{ m}$$

$$\frac{5}{7} = \frac{42000}{6048}$$

$$S = \frac{350 \text{ m/s}}{36}$$

km/hr  $\rightarrow$  m/s

$\frac{5}{8}$

divide

$$\frac{350 \times 18}{36} = 35 \text{ km/hr}$$