Time Speed & Distance

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Q. Two cars starts from A to B one at 20 kmhr and another at 30 kmph which starts 1½ hrs later & reached 2½ before first car what is the distance?

→

$$\text{time}_1 \times \text{speed}_1 = \text{time}_2 \times \text{speed}_2$$

$$x \times 20 = y \times 30$$

$$(y + 1.5 + 2.5)\,20 = y \times 30$$

$$y = 8$$

$$d = \text{time} \times \text{speed}$$

$$= 30 \times 8$$

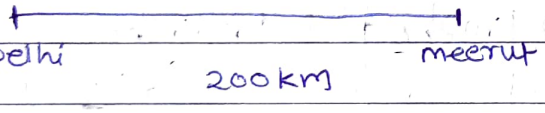
$$\boxed{d = 240 \text{ km}}$$

Q. Train A starts from delhi to meerut at 6 a.m. reach 10 a.m. Train B starts from meerut to delhi at 8 a.m. reach ~~11~~ 11:30 am at what time they meet each other? (delhi-meerut = 200 km)

→

$S_A = \frac{200}{4} = 50 \text{ kmhr}$

$S_B = \frac{200}{3.5} = \frac{400}{7} \text{ kmhr} \approx 58 \text{ kmhr}$



As A starts 2 hrs early it covers 100 km in 2 hrs. Now to cover remaining distance lets say one train stationary then relative speed is the speed and distance is 100 km.

$\therefore$ time $= \frac{100}{(50+58)} = \frac{100}{108} \approx 0.92$

$\therefore$ total time 2 hrs + 0.92 hrs

$\therefore$ time 2.56 hrs after 8 am.

$\therefore$ 8.56 am

1.

$S_A = \frac{200}{4} = 50 \text{ kmph}$

$S_B = \frac{200}{3.5} = \frac{400}{7} \text{ kmphr}$

$d_1 + d_2 = d$

$50 \times x + \left(\frac{400}{7}\right)(x-2) = 200$

$x = \frac{2200}{750} \approx 2.56 \text{ hrs}$

time = 8.56 am

Q. Train T_1 & T_2 starts from Ahmadabad & mubumai respectively and reaches mumbai Ahmdabad at 12 am and 1 at what time they meet?

→ relative speed $= \frac{d}{5} + \frac{d}{6} = \frac{11d}{30}$

$$\text{time} = \frac{\text{distance}}{\text{speed}} = \frac{d}{\left(\frac{11d}{30}\right)} \approx 2.82 \approx 2:43 \text{ hrs}$$

time = 9:43 am

Q. tiger is 50 leap behind deer, tiger takes 5 leaps/mi deer takes 4 leap/min, tiger deer covers 8m & 5 per leap at what distance tiger run to catch de

→ $S_t = \frac{5 \times 8}{60} = \frac{2}{3}$ m/sec

$S_d = \frac{4 \times 5}{60} = \frac{1}{3}$ m/sec

time is constant.

$\left(\frac{2}{3}\right) \times (x + 50 \times 8) = \left(\frac{1}{3}\right)(x)$

$x = 800$m

Q. If train travels at 144 kmphr and 100 kmhr then reach 20 ahead, 24 min behind schedules what is avg ~~time~~ Speed reach on schedule?

→ Let take difference of times taken each time.

$t_1 - t_2 = \Delta t$

$\left(\frac{d}{100}\right) - \left(\frac{d}{144}\right) = \frac{44}{60}$

$d = 240$ km

time taken by train with 100 km hr is

$$\text{time} = \frac{d}{\text{speed}} = \frac{240}{100} = 2.40 \approx 2:24 \text{ hrs}$$

The remaining 24 min is extra taken by train her Shedued time is 2 hrs then speed to cover 240 in 2 hrs is

speed = 120 kmphr

Q. Train p and Q starts from 7am & 8am from distance of 110 km apart with 20 kmhr & 25 kmhr resp. at what time they meet?

→ $d_1 + d_2 = d$

$x(20) + (x-1)\times 25 = 110$

$\boxed{x = 3}$

$\boxed{\text{train meet at } 7am + 3hr = 10am}$

Q. Yana and Gupta leaves X and Y towards Y and X after meeting each other they reach after 4hrs and 9 hours If speed of Yana is 48 km/hr what is speed of Gupta

→

As Both starts at same time and meet each other, time taken by both is equal.

Q. One drove m mile in h hour and arrived $\frac{1}{2}$ hr late. What should be speed to reach on time?

→ time should be $h - \frac{1}{2} = \frac{2h-1}{2}$

$\therefore$ **Speed $= \frac{2m}{2h-1}$**

Q. Train overtake two men with 4.5 km/hr, 5.4 km/hr in 8.4 & 8.5 seconds what is the speed of tra

→ distance is same i.e length of train, distan travelled by person neglected when we take relative speed as they assume to be station

$$\therefore \frac{(8.4)(S_t - 4.5)}{18/5} = \frac{(8.5)(S_t - 5.4)}{18/5}$$

$\therefore$ **$S_t = 81$ km/hr**

Q. P, Q, R in race, P cycles twice speed of Q, R cycles $\frac{1}{2}$ of Q if R complete race in 45 min where is Q when P finishes race?

→ **at centre**

Q. A, B walks from delhi & Jammu after meeting in somewhere reaches to destinations after 36 & 28 hr resp. what is the ratio of speeds of A : B ?

→ If two bodies start moving toward each other at same time finishes distance (same) in x and y hrs after crossing then, ratio of their speed is

$$\frac{S_A}{S_B} = \sqrt{\frac{t_B}{t_A}} = \frac{17}{19}$$

Q. Ramesh runs at 7 m/s to catch thief which is at 80m running with 5 m/s how much distance thief travells before ramesh catch him?

→ ∴ Relative Speed (2 m/s) when we take take relative Speed we assume one object is stationary

∴ time to catch = $\frac{80\text{ m}}{2\text{ m/s}}$ = 40 sec

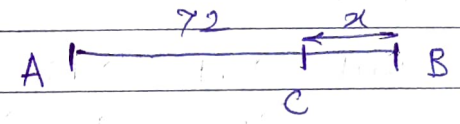
∴ In 40 sec theif runs (40 × 5) = 200 m

Q. Ajay, Vijay travel from A to B at 19 kmhr & 17 kmhr Ajay reach B travel back and meet Vijay at C distance of B-C? when A to B is 72 m.

→ time taken is constant

∴ $\frac{72+x}{19} = \frac{72-x}{17}$

∴ $x = 4$



ABC = 72 + x

AC = 72 − x

Q. Squirrel climbs 5m in min and in next min it slips 2m how much time it will take to reach 26 m?

→ It takes 2 min to climb 3 m.

for first 21 m it takes 14 min.

at last climb it will reach 1 min to 26 m.

∴ total time 15 min

Q. If car travells and overtakes two bikers who are at 6 kmhr & 9 kmhr in 9 and 10 sec what is speed of car?

→ Let x is length of car here distance is constant

$t_1 \times s_1 = t_2 \times s_2$

9 (carspeed − 6) = 10 (Speed − 9)

Carspeed = 66 km/hr

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Q. Cab overtake auto at 11 am reaches Benglore at 1:30 pm take rest for 1 hour and return meet auto at 3pm how much time auto will take to reach Benglore?

→

Cab cover x distance in (1:30 − 11) = 2.5 hrs ∴ Cab speed
Cab take rest till 2:30 pm and cross back auto at 3 pm
means in (3 pm − 2:30 pm) = 0.5 hrs cab will get back
to distance $= (0.5) \times \left(\frac{x}{2.5}\right) = \frac{x}{5}$ distance.

∴ Auto have to cover $(x/5)$ distance now.

But Auto has covered $\left(\frac{4x}{5}\right)$ distance in 4 hrs
i.e. (3 pm − 11 am) ∴ speed of auto $\left(\frac{4x}{5\times4}\right) = \frac{x}{5}$ /hr

∴ Auto will cover $\frac{x}{5}$ distance at $\frac{x}{5}$ speed in 1 hr

∴ Auto will reach at 4 pm

Q. If once travel 4 kmphr for 45 min take break for 15 how much time require to reach 12 km.

→ In 45 min he travels 3 km
to travel 12 km he have session of 4 of 45 min
and three breaks not 4 breaks
∴ (45×4 + 15×3) mins
3 hours 45 min

Q. Speed of man with current 15 speed of current 2.5 what is speed against current?

→ water current
Relative speed against = 10
current.