

Speed

Type: Zero length traveling bodies, Two variable algebra, General Problem Solving

Q1. Two cyclists cover same distance in 30km/hr and 32km/hr respectively. Find the distance travelled by each, if one takes 16 min longer than other.

- A. 128km B. 64km C. 72 km D. None of these

Slow Cyclist

Fast Cyclist

S: 30

32

D: D

D

T: T

T-(16/60)

$$T(\text{Fast Cyclist}) - T(\text{Slow Cyclist}) = 16/60$$

$$D/30 - D/32 = 16/60$$

Solving D = 128

Q2. A cyclist sets out along a certain road at an average speed of 16m/hr. Half an hour later a motorist starts from the same place to overtake him. If the motorist's average speed is 48 km/hr, find out how many kilometers he must travel before he overtakes the cyclist?

- A. 12km B. 11km C. 13km D. 14km

$$T(\text{Cyclist}) - T(\text{Motorist}) = 0.5$$

$$D/16 - D/48 = 0.5$$

Solving D = 12

Q3. The J&K express from Delhi to Srinagar was delayed by snowfall for 16 minutes and made up for the delay on a section of 80 km traveling with a speed 10 km per hour higher than its normal speed. Find the original speed of the J&K express. (according to the schedule)

- A. 60 km/h B. 66.66 km/h C. 50 km/h D. 40 km/h

$$T(\text{Normal}) - T(\text{Snowfall}) = 16/60$$

$$80/S - 80/(S+10) = 16/60$$

Solving S = 50

Q4. A man travels from his home to office at 4km/r and reaches his office 20 min late. If the speed had been 6 km/hr he would have reached 10 min early. Find the distance from his home to office?

$$T(\text{Late}) - T(\text{Early}) = 30/60$$

$$D/4 - D/6 = 1/2$$

Solving D = 6

Q5. A bus was travelling from Koyambedu to Salem Bus Stand via Vellore. A bus was travelling at a speed of 72 km per hour. However when taking into account the stoppage time the average speed became 60 km/hour. How many minutes does the bus stops in an hour? [TCS]

- A. 8 min B. 12 min C. 15 min D. 10 min.

Let the entire journey be 1hour and bus stopped for x minutes in one hour.

That means bus was moving for $1-(x/60)$ hour.

$$D(\text{With stoppage}) - D(\text{Without stoppage}) = 0$$

$$60 * 1 - 72 * [1 - (x/60)] = 0$$

$$\text{Solving } x = 10\text{min}$$

Type: Zero length traveling bodies, Two variable algebra, Boats and Streams

Q6. A boat takes 20 min and 30 min to cover a particular distance downstream and upstream respectively. If the speed of the boat in still water is 20 m/s, find the speed of the stream.

- A. 11m/s B. 7.33m/s C. 4m/s D. 12m/s

Let s be the speed of the stream. So the net speed of boat upstream is (20-s) and downstream is (20+s).

$$D(\text{Upstream}) - D(\text{Downstream}) = 0$$

$$(20-s) * 30 * 60 - (20+s) * 20 * 60 = 0$$

$$\text{Solving } s = 4\text{m/s}$$

Q7. A man rows 27 km downstream and 18 km upstream taking 3 hr each time. What is the speed of the current?

- A. 4km/ hr B. 1 km/hr C. 1.5 km/hr. D. 2 km/hr

Let speed of boat be X and speed of stream be y.

$$\text{Speed of boat in upstream} = x - y$$

$$\text{Speed of boat in downstream} = x + y$$

$$\text{Speed(Downstream)} - \text{Speed (Upstream)} = 2y$$

$$27/3 - 18/3 = 2y$$

$$\text{Solving } y = 1.5$$

Q8. A man can row 5 kmph in still water. If the river is running at 1kmph, it takes him 75 minutes to row to a place and back. How far is the place? [AMCAT]

- A. 3km B. 2.5km C. 4km D. 5km

$$\text{Time(Upstream)} + \text{T(Downstream)} = 75/60$$

$$D/(5-1) + D/(5+1) = 75/60$$

$$\text{Solving } D = 3$$

Type: Finite length traveling bodies, Relative Speed

Q9. A train crosses a platform which is 250 m long. The speed of the train is 36 km/hr. The total time taken for the train to cross the platform is 35s. Find the length of the train.

- A. 120M B. 110M C. 100M D. None of these.

$$38 * (5/18) = (250+L)/35 \Rightarrow L = 100$$

Q10. A train, 110 m long is travelling at 58 km/hr. What is the time in which it will cross a man walking in the same direction at 4 km/hr?

- A. 11s B. 7.33s C. 10s D. 12s

$$(58-4) * (5/18) = 110/T \Rightarrow T = 7.33$$

Q11. The length of Banjara mail is 120m and that of Pali mail is 80m. These two trains are running in the opposite direction with speeds of 40km/h and 50km/h respectively. The time taken by them to cross each other is:

- A. 8 Sec B. 72 Sec C. 12 Sec D. None of these

$$(50+40)*(5/18) = (120+80)/T \Rightarrow T = 8$$

Type: Miscellaneous, Average Speed

Q12. Anand covers first half distance of the journey at 40kmph and second half at 60kmph. What is his average speed of the journey?

- A. 50kmph B. 42kmph C. 48kmph D. None of these.

When two equal distances are covered at x km/hr and y km/hr respectively, then Average Speed of the whole journey is **$2xy/(x+y)$** km/hr.

$$= 2*40*60/(40+60) = 48$$

Q13. Every day a cyclist meets a car at the station. The road is straight and both are travelling in the same direction. The cyclist travels with a speed of 12 mph. One day the cyclist comes late by 20 min. and meets the car 5miles before the Station. What is the speed of the car? [INFOSYS]

1. Car is maintaining same schedule. At this moment (when car and cyclist met Today) on a normal day, car would have been 5 miles before the station.
2. Yesterday at this moment, Cyclist would have been 4miles ahead of Today's meeting point. That is just 1mile from the station.
[On a normal day by now cyclist would have cycled 20min more in which he would have traveled $12\text{mph} * (1/3)\text{hr} = 4\text{ miles}$]
3. On a normal day, by the time cyclist covered 1mile and reached the station, car would travel 5miles and meet the cyclist at the station.

That is in the same time, car travels 5 times more distance than cyclist. So the speed of car is 5 times that of cyclist.

$$\text{Speed of the car} = 5*12 = 60\text{miles/hour}$$

Practice Questions

Q1. A student takes 20 minutes to reach his college if he walks at a speed of 15kmph. What speed should he travel if he should reach the college in 15 minutes? [Rancore Technologies]

$$D(\text{Original Speed}) - D(\text{Enhanced Speed}) = 0$$

$$15*(20/60) - S(15/60) = 0 \Rightarrow S = 20$$

Q2. A boy starts out from town A to cycle towards town B, 90km away, at an average speed of 16km/hr. At the same moment a motorist leaves town B and travels towards town A at an average speed of 56km/hr. After how many hours do they meet?

- A. 1.5hr B. 1.75hr C. 1.4hr D. 1.25hr

$$D(\text{Cyclist}) + D(\text{Motorist}) = 90$$

$$16*T + 56*T = 90$$

$$\text{Solving } T = 1.25$$

Q3. Suresh calculates that his time to cycle 30km would have been half an hour less if he had cycled 2km/hr faster all the way. Find the speed at which he cycled.

A. 9km/hr

B. 10km/hr

C. 8km/hr

D. 11km/hr

$$T(\text{Actual}) - T(\text{Proposed}) = 0.5$$

$$30/S - 30/(S+2) = 0.5$$

$$\text{Solving } S = 10$$

Q4. 2 trains are running on parallel rails and they and they travel at the rates of 25 kmph and 30 kmph. If the first train leaves an hour earlier than the second train, then how long will it take for the 2nd train to catch up with the 1st one?

A. 4 hr

B. 12hr

C. 5 hr

D. None of these.

$$D(\text{First train}) - D(\text{Second train}) = 0$$

$$25(T+1) - 30T = 0$$

$$\text{Solving } T = 5$$

Q5. A boy travels x km at 10km/hr and a further (x+4) km at 8km/hr. If the total time taken is 5 hours, find x.

A. 21

B. 19

C. 22

D. 20

$$T_1 + T_2 = 5$$

$$x/10 + (x+4)/8 = 5$$

$$\text{Solving } x = 20$$

Q6. Maruti Cruisers sailed 132 km along with the river in six hours. Suddenly the boat had to return to the starting point and it started returning against the river and this time the Cruiser travelled at 128 km in eight hours. By how much percentage Cruiser's speed exceeds the speed of the River ?

A. 533.33%

B. 444.44%

C. 267.67%

D. None of these.

Let the speed of Cruiser = X

Let the speed of river = Y

$$X+Y = 132/6 = 22$$

$$X-Y = 128/8 = 16$$

Solving X = 19 and Y = 3 which means cruiser is $16/3\% = 533.33\%$ faster than the river.

Q7. The driver of a car sees a bus 40m ahead of him. After 20 seconds the bus is 60m behind. If the speed of the car is 30km/hr, what is the speed of the bus?

[L&T Infotech]

A. 9 kmph

B. 20 kmph

C. 12 kmph

D. 10 kmph

Let the speed of the bus be S kmph

$$(30-S) \times (5/18) = 100/20$$

$$\text{Solving } S = 12$$

Q8. In a one Kilometer race, A beats B by 36 meters or 9 seconds. Find A's time over the course.

A. 225 sec

B. 235 sec

C. 220 sec

D. 241 sec

From given data B covers his last 36m in 9 sec. So his speed = $36/9 = 4\text{m/s}$ which means he takes 250sec to cover the 1km race.

Since A beats B by 9 seconds his time over the course is 241s.

Q9. If successive telephone posts are 20m apart along a straight road and a car passes from the 1st to the 13th post in 16sec, how fast is the car traveling in km/hr.

A. 54 km/hr

B. 53 km/hr

C. 52 km/hr

D. 55 km/hr

Between 13 poles there are 12 equidistance regions.

$$\text{Speed} = [12 \times 20 / 16] \times (18/5) = 54 \text{ km/hr}$$