

## **SPEED, TIME & DISTANCE**

## **Problems on Trains:**

Train "A" → Length = L 1, Speed = X





Train "B" → Length = L 2, Speed = Y

- ❖ If Train 'A' is moving faster and parallel to train 'B' then
  - Relative speed is (S<sub>r</sub>) = (X Y)
  - Time taken by two trains to cross each other is

Right path f Time = 
$$\frac{L_1 + L_2}{X - Y}$$
 eer.

- ❖ If Train 'A' is moving opposite to train 'B' then
  - Relative speed is (S<sub>r</sub>) = (X + Y)
  - Time taken by two trains to cross each other is

Time = 
$$\frac{L_1 + L_2}{X + Y}$$



➤ A train without stoppage travels with an average speed of X km/h, and with stoppage, it travels with an average speed of Y km/h. For how many minutes does the train stop on an average per hour is

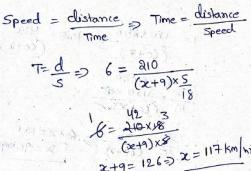
Stoppage per hour = Difference in Avg.Speed x 60 min

**Speed without Stoppage** 

- > If two trains (or bodies) start at the same time from points A and B towards each other and after crossing they take a and b seconds in reaching B and A respectively, then (A's speed): (B's speed) =  $\sqrt{b}$ :  $\sqrt{a}$
- 1) A 210 metre long train takes 6 seconds to cross a man running at 9 km/hr in a direction opposite to that of the train. What is the speed of the train? (in km/hr)

Ans: 117 kmph

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2) A train 100m long is running at the speed of 30 km/hr. Find the

time taken by it to pass a man standing near the railway line.

Ans: Time = 12sec

2.) 
$$T = \frac{D}{S} \Rightarrow T = \frac{100}{30 \times 5}$$
 $T = \frac{100}{30 \times 18}$ 
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3) A train is moving at a speed of 132 km/hr. If the length of the train is 110 metres, how long will it take to cross a railway platform 165 metres long?

Ans: Time = 7.5 sec

3.) 
$$T = \frac{D}{S} \Rightarrow T = \frac{1275}{132 \times 5} \Rightarrow \frac{275 \times 18}{182 \times 8} = \frac{132 \times 8}{2} = \frac{15}{2} = 7.5 \text{ Sec}$$

4) Two trains of length 110 m and 90 m are running on parallel lines in the same direction with a speed of 50 km/hr and 45km/hr respectively. In what time will they pass other?

Ans: Time = 144sec

5) A 180-metre long train crosses another 270-metre long train running in the opposite direction in 10.8 seconds. If the speed of the first train is 60 kmph, what is the speed of the



second train in kmph?

Ans: 90 kmph

6.) 
$$T = \frac{d}{8}$$
 [Iminute = 60 sec]  
 $60 = [800 + x]$   
 $78 \times \frac{5}{18}$   
 $60 = [800 + x] \times 18 \times 5$   
 $78 \times$ 

6) A train 800 metres long is running at a speed of 78 km/hr If it crosses a tunnel in "1" minute, then the length

of the tunnel (in meters) is:

Ans: 500 meters



Stoppage per hour = 
$$\frac{50-40}{50} \times 60 \text{ min}$$
  
=  $\frac{10}{50} \times 60 \text{ min}$ 

7) A train without stoppage travels with an average speed of

50 km/h, and with stoppage, it travels with an average speed of 40 km/h. For how many minutes does the train stop on an hour?

Ans: 12 minutes



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good's train taken 'q' seconds

to pass him.

$$T = \frac{\text{distance}}{\text{Speed}}$$

$$9 = \frac{80}{(x+50)} \times \frac{5}{18}$$

$$19 = \frac{256}{(x+50)} \times 8$$

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