TIME AND DISTANCE SOLUTION

A and B are 20 km apart. A can walk at an average speed of 4 km/hr and B at 6 km/h. If they start walking towards each other at 7:000 am, when they will meet?

- Solution
- Suppose they will meet after T hours.
  Distance = Speed x Time
  Sum of distance traveled by them after T hours
  6T + 4T = 20 km
  T = 2 hours.
  So they will meet at 7:00 AM + 2 hours = 9:00 AM

A plane flies along the four sides of a square field at a speed of 200, 400, 600 and 800 km/hr. Then find the average speed of plane around the square field.

- Solution
- Let the side of the square field be x and the average speed of plane be y

  $x/200 + x/400 + x/600 + x/800 = 4x/y$
  $\Rightarrow 25x/2400 = 4x/y$
  $\Rightarrow y = 384$

  $\therefore$ Average speed is 384 km/hr

Laxman has to cover a distance of 6 km in 45 minutes . If he cover one half of the distance in 2/3rd time . what should be his speed to cover the remaining distance in the remaining time?

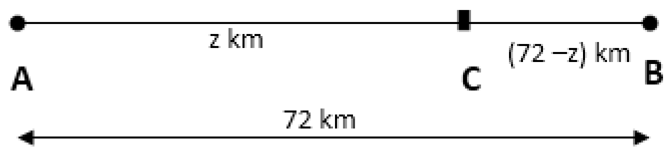
- Solution
- ∵ Time left = (1/3 X 45/60) hr.
  = 1/4 hr.
  Distance left = 3km

  ∴ speed required = [3 / (1/4)] km/hr.
  = 3 x 4
  =12km/hr .

To reach school half an hour early, Meera has to increase her speed to 7/4 of her usual speed. How much time does she take every day to reach the school?

- Solution
- We know, Distance travelled is same both times.
- ∴ D = D
- $\therefore S \ x \ T \ = \frac{7S}{4} \ x \ (T - 30)$
- ∴ 4T = 7T - 210
- ∴ T = 70 min

Two cities Alipur and Balipur are 72 km apart. Arun and Varun who stay at Alipur start riding on bicycle to Balipur. Arun travels at a speed of 17 kmph while Varun's speed is 2 kmph more than Arun. Varun was riding faster, so he reaches Balipur early and returns immediately. On his way back he meets Arun at Chandipur . How far is Chandipur from Balipur?



- To make things easy, let's set some notations:Alipur - A ; Balipur - B; Chandipur - C

  Let distance between A and C be 'z'
  ∴ Distance between B and C = 72 – z
  Distance travelled by Arun = AC = z km
  Distance travelled by Varun = AB + BC = (72+(72-z)) = (144-z) km
- We know, time for both is same
- ∴ T = T
- ∴ $\frac{z}{17} = \frac{144-z}{19}$
- ∴ z = 68 km
- ∴ Distance between B and C = 72 - z = 72 - 68 = 4 km
- Now, if it is asked to calculate total distance travelled by Varun before meeting Arun, do as follows -
- Distance travelled by Varun before meeting Arun = AB + BC = 72 + 4 = 76 km

A dog sees a cat 80 m away. The cat runs at a speed of 5 m/s while the dog chases it at a speed 2 m/s more than that of cat. Before the dog is able to catch the cat, how much distance has it already run?

- Let distance travelled by cat before dog catches it be D
- We know, time for which Dog and Cat ran is same
- ∴ T = T
- ∴ $\frac{D}{5} = \frac{D+80}{7}$
- ∴ D = 200 m

Ramesh says, "Driving at an average speed of 60 kmph, I reach office 10 minutes early. However, if I drive at a speed 10 kmph lesser than the earlier, I get late by half an hour". Find the distance between Ramesh's office and home.

- Solution
- Let distance be D
- With speed 50km/hr (10 kmph less than the earlier 60 kmph), he is 30 minutes late
- With speed 60 km/hr he is 10 minutes early
- ∴ Difference between two times = 30+10 = 40min = $\frac{40}{60}$hours
- lso, time = $T = \frac{D}{S}$
- $\frac{D}{50} - \frac{D}{60} = \frac{40}{60}$
- ∴ D = 80 km

Two stations P and Q are 330 km apart. A train leaves the station A at 8 am and runs towards B at 60 kmph. Another train travels from B to A at a speed 75 kmph. What would be the time by the watch when the two trains meet?

- Solution
- Suppose they meet x hrs after 8 a.m .
  Then (Distance moved by first in x hrs) + (Distance moved by second in (x - 1) hrs] = 330
  $60x + 75(x - 1) = 330$
  $x = 3$
  So , they meet at (8 + 3) , i.e. 11 a.m

A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

- Explanation:

- Speed $=60 \times \frac{5}{18}\, m/\text{sec} \qquad =\frac{50}{3}\, m/\text{sec}.$
- Length of the train = (Speed x Time).

- Length of the train $= \frac{50}{3} \times 9m = 150\, m.$

Two trains running in opposite directions cross a man standing on the platform in 27 seconds and 17 seconds respectively and they cross each other in 23 seconds. The ratio of their speeds is:

- Solution
- Let the speeds of the two trains be x m/sec and y m/sec respectively.
- Then, length of the first train = 27x metres,and length of the second train = 17y metres.
- $\frac{27x + 17y}{x+y} = 23$
- $27x + 17y = 23x + 23y$
- $4x = 6y$
- $\frac{x}{y} = \frac{3}{2}$