Let's work out!

P1 How long will it take for a person to cover 60000 meters who is going at a speed of 45 km per hour?

(a)1.33 hours (b)80 minutes (c) Both (a) & (b) (d) None of these

km/hr → m/s

$1\ km/hr = \frac{1000m}{3600sec} = \frac{5}{18}\ m/s$

$1\ m/s = \frac{18}{5}\ km/hr$

Let's work out!

P1 How long will it take for a person to cover 60000 meters who is going at a speed of 45 km per hour?

(a)1.33 hours (b)80 minutes (c) Both (a) & (b) (d) None of these

$D = 60000\ m = 60\ km$

$S = 45\ km/hr$

$t = \frac{60}{45} = \frac{4}{3} = 1.33\ hr$

$\frac{4}{3} \times 60^{20} = 80\ min$

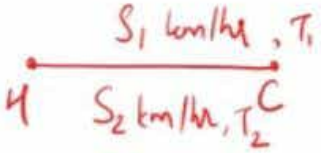
Let's work out!

P1 How long will it take for a person to cover 60000 meters who is going at a speed of 45 km per hour?

(a)1.33 hours (b)80 minutes (c) Both (a) & (b) (d) None of these

Average Speed = $\frac{\text{Total Dis}}{\text{Total Time}}$

Av Speed = $\frac{S_1 + S_2}{2}$



$S_1 = \frac{D}{T_1}$ $S_2 = \frac{D}{T_2}$

$\Rightarrow T_1 = \frac{D}{S_1}$ $\Rightarrow T_2 = \frac{D}{S_2}$

Av. Speed = $\frac{2D}{\frac{D}{S_1} + \frac{D}{S_2}}$

$S_{av} = \frac{2 S_1 S_2}{S_1 + S_2}$

Let's work out!

P2 There are two towns X and Y. Amit goes from X to Y at 40 km per hour and comes back to the town X on the same route at 30 km per hour. Then what is his average speed over the journey?

(a)31.5 km/h (b)34.3 km/h (c) 35 km/h (d)37.5 km/h

$$S_{AV} = \frac{2 S_1 S_2}{S_1 + S_2}$$

$$= \frac{2 \times 40 \times 30}{70}$$

$$= \frac{24}{7} \times 10$$

71 24 (3.42
-21
30
-28
2

Let's work out!

P2 There are two towns X and Y. Amit goes from X to Y at 40 km per hour and comes back to the town X on the same route at 30 km per hour. Then what is his average speed over the journey?

(a)31.5 km/h (b)34.3 km/h (c) 35 km/h (d)37.5 km/h

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$$= \frac{2 \times 40 \times 30}{70}$$

$$= \frac{24}{7} \times 10$$

71 24 (3.42
-21
30
-28
2

Le

P3 There are two s from P to Q at 20 km per hour and comes back to th ute at a certain speed. If his average speed over the j ur then what was his speed in the return journey?

(a)80 km/h (b) (d)None of these

$S_{AV} =$ $\Rightarrow S_2 = 80 km/hr$

$\frac{84}{32} =$

$20+S_2$

$\Rightarrow 80 + 4S_2 = 5S_2$

Colors

Size

00:27

Let's work out!

P4 Rahul goes to school from his village at 3 km / h and returns back at 2 km / hr. If he takes 5 hours in all, what is the distance between village and school?

(a) 5.75 km (b) 6 km (c) 12 km (d) None of these

$$T_1 + T_2 = 5$$

$$\frac{D}{3} + \frac{D}{2} = 5$$

$$\Rightarrow \frac{5D}{6} = 5$$

$$\Rightarrow D = 6 \text{ km}$$

Let's work out!

P4 Rahul goes to school from his village at 3 km / h and returns back at 2 km / hr. If he takes 5 hours in all, what is the distance between village and school?

(a) 5.75 km (b) 6 km (c) 12 km (d) None of these

$T_1 + T_2 = 5$

$\frac{D}{3} + \frac{D}{2} = 5$

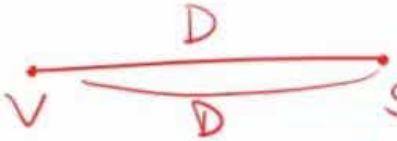
$\Rightarrow \frac{5D}{6} = 5$

$D = 6$ km

$\Rightarrow$

$D = \frac{24}{10} \times 5$

$= \frac{12\text{ km}}{2} = 6\text{km}$



Av Speed $= \frac{2 S_1 S_2}{S_1 + S_2}$

$= \frac{2 \times 3 \times 2}{5}$

$= 2.4$ km/h

Let's work out!

P5 Walking at (5 / 6th) of his usual speed a man reaches 12 minute late. Find its usual time to cover the journey.

(a)1 hour (b)20 minutes (c)50 minutes (d)None of these

$t+12$

$$\frac{S_1}{S_2} = \frac{T_2}{T_1}$$

$$\frac{S}{\frac{5}{6}S} = \frac{t+12}{t}$$

$$\Rightarrow \frac{6}{5} = \frac{t+12}{t}$$

$$\Rightarrow 6t = 5t + 60$$

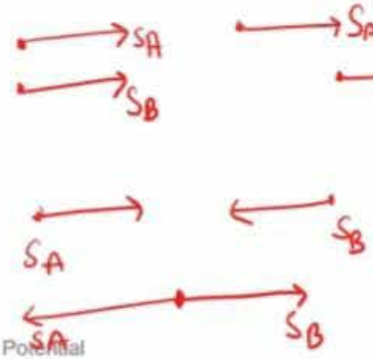
$$\Rightarrow t = 60\text{min} = 1\text{ hr}$$

Let's work out!

P6 A burglar was 2.16 km ahead of cop when cop started chasing him. How long will it take for cop to chase the burglar when the speed of cop & burglar is 15m/sec and 11m /sec, respectively?

(a) 18 minutes (b) 27 minutes (c) 4.5 minutes (d) 9 minutes

Relative Speed



$$\text{Speed (Relative)} = |S_A - S_B|$$

$$\text{Speed (Relative)} = (S_A + S_B)$$

Let's work out!

P6 A burglar was 2.16 km ahead of cop when cop started chasing him. How long will it take for cop to chase the burglar when the speed of cop & burglar is 15m/sec and 11m /sec, respectively?

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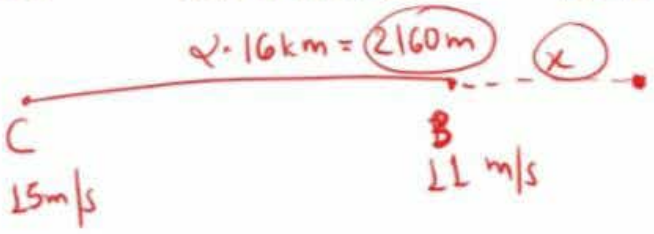


$T_1 = T_2$

$\frac{2160+x}{15} = \frac{x}{11}$

$\Rightarrow \frac{2160}{15} = \frac{x}{11} - \frac{x}{15}$

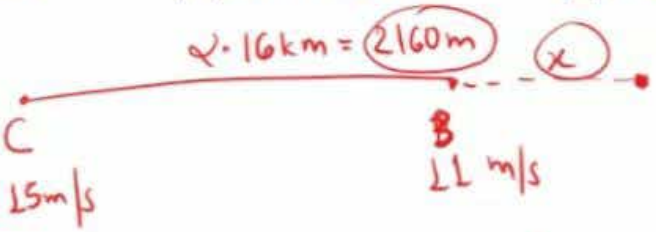
$\Rightarrow \frac{540}{\cancel{2160}} = \frac{\cancel{4}x}{165\,11}$

$\Rightarrow x = \frac{540}{11}$

Let's work out!

P6 A burglar was 2.16 km ahead of cop when cop started chasing him. How long will it take for cop to chase the burglar when the speed of cop & burglar is 15m/sec and 11m /sec, respectively?

(a) 18 minutes (b) 27 minutes (c) 4.5 minutes (d) 9 minutes



Time $= \frac{540}{11} \times 11$ sec

$= \frac{540}{60} = 9$ min

$T_1 = T_2$

$\frac{2160+x}{15} = \frac{x}{11}$

$\Rightarrow \frac{2160}{15} = \frac{x}{11} - \frac{x}{15}$

$\Rightarrow \frac{540}{\cancel{2160}\ 15} = \frac{4x}{165\ 11}$

$\Rightarrow x = \frac{540}{11}$

Let's work out!

P6 A burglar was 2.16 km ahead of cop when cop started chasing him. How long will it take for cop to chase the burglar when the speed of cop & burglar is 15m/sec and 11m /sec, respectively?

(a) 18 minutes (b) 27 minutes (c) 4.5 minutes (d) 9 minutes

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(a) 18 minutes (b) 27 minutes (c) 4.5 minutes (d) 9 minutes

$= \frac{D}{T}$

$\text{Time} = \frac{2160}{4}$

$\text{Time} = \frac{540}{60} = 9 \text{ min}$

Let's work out!

P6 A burglar was 2.16 km ahead of cop when cop started chasing him. How long will it take for cop to chase the burglar when the speed of cop & burglar is 15m/sec and 11m /sec, respectively?

(a) 18 minutes (b) 27 minutes (c) 4.5 minutes (d) 9 minutes

$S_{relative} = \frac{D}{T}$ Time $= \frac{2160}{4}$ Dist

Time $= \frac{540}{60} = 9$ min

Let's work out!

P7 A certain distance is covered at a speed V km/h. If half of the same distance is covered in double the time, then the ratio for the former speed to that of the latter is

(a) 4:1 (b) 1:4 (c) 2:1 (d) 1:2

$$\frac{S_1}{S_2} = \frac{T_2}{T_1}$$

$$\frac{V}{S} = \frac{2D/T}{D/2T}$$

$$= \frac{2D}{T} \times \frac{2T}{D}$$

$$= 4:1$$

Total dis = 2D

Time = T

$$V = \frac{2D}{T}$$

$$S = \frac{D}{2T}$$

Let's work out!

P8 An express train travels 299 km between two cities. During the first 111 km of the trip, the train travelled through mountainous terrain. The train travelled 10 km/h slower through mountainous terrain than through level terrain. If the total time to travel between two cities was 7 h, what is the speed of the train on level terrain?

(a) 56kmph (b) 55kmph (c) 47kmph (d) 88kmph

Let's work out!

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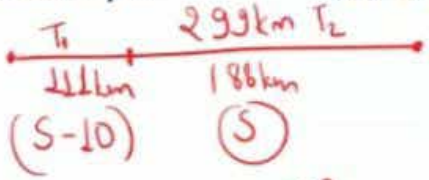

$T_1 = \frac{111}{S-10}$ $T_2 = \frac{188}{S}$

$T_1 + T_2 = T$

$\frac{111}{S-10} + \frac{188}{S} =$

Let's work out!

P8 An express train travels 299 km between two cities. During the first 111 km of the trip, the train travelled through mountainous terrain. The train travelled 10 km/h slower through mountainous terrain than through level terrain. If the total time to travel between two cities was 7 h, what is the speed of the train on level terrain?

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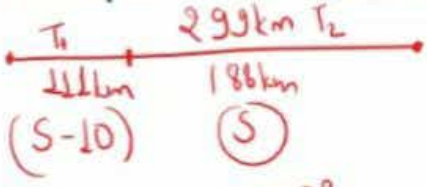


$T_1 = \frac{111}{S-10}$ $T_2 = \frac{188}{S}$

$T_1 + T_2 = T$

$\frac{111}{S-10} + \frac{188}{S} = 7$

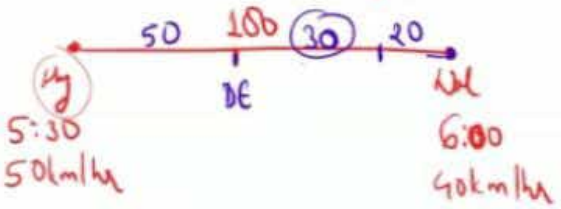
$\frac{111}{37} + \frac{188}{47}$

3+4 = 7

Let's work out!

P9 Deccan express which goes from Hyderabad to Chennai leaves Hyderabad at 5:30 am and travels at a constant speed of 50 km/h towards Nalgonda which is 100 km away. At 6:00 am, Khema express leaves from Nalgonda for Hyderabad at a constant speed of 40 km/h. At 6:30 am Mr. Raut, the Control Officer realizes that both the trains are on the same track. How much time does Mr. Raut have to avert the accident?

(a) 20 min (b) 30 min (c) 25 min (d) 15 min



6:30

$$\text{Speed} = \frac{30}{T}$$

$$90 = \frac{30}{}$$

Let's work out!

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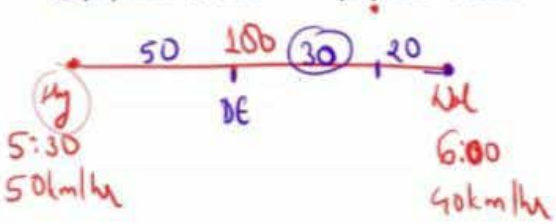

6:30

$Speed_{(R)} = \frac{30}{T}$

$90^{3} = \frac{30}{T}$

$T = \frac{1}{3} \times 60 =$

Let's work out!

P9 Deccan express which goes from Hyderabad to Chennai leaves Hyderabad at 5:30 am and travels at a constant speed of 50 km/h towards Nalgonda which is 100 km away. At 6:00 am, Khema express leaves from Nalgonda for Hyderabad at a constant speed of 40 km/h. At 6:30 am Mr. Raut, the Control Officer realizes that both the trains are on the same track. How much time does Mr. Raut have to avert the accident?

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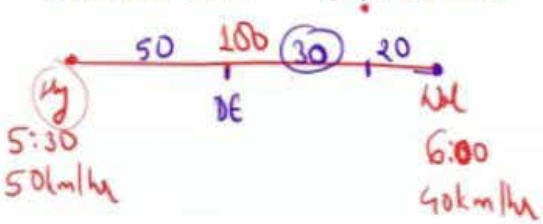

6:30

Speed = $\frac{30}{T}$

$90^{3} = \frac{30}{T}$

$T = \frac{1}{3} \times 60 = 20\text{min}$

Let's work out!

P9 Deccan express which goes from Hyderabad to Chennai leaves Hyderabad at 5:30 am and travels at a constant speed of 50 km/h towards Nalgonda which is 100 km away. At 6:00 am, Khema express leaves from Nalgonda for Hyderabad at a constant speed of 40 km/h. At 6:30 am Mr. Raut, the Control Officer realizes that both the trains are on the same track. How much time does Mr. Raut have to avert the accident?

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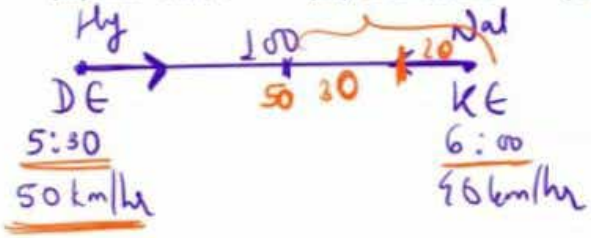


At 6:30

$$\text{Speed (relative)} = \frac{30}{T}$$

$$90 = \frac{30}{T}$$

$$T = \frac{1}{3}\text{ hr}$$

$$T = \frac{1}{3} \times 60 = 20$$

Let's work out!

P10 Arun covers a certain distance on a toy train. If the train moved 4 km/h faster, it would take 30 min less to cover the same distance. If it moved 2 km/h slower, it would have taken 20 min more to cover the same distance. Find the distance.

(a) 60km (b) 45km (c) 30km (d) 20km

S T

Dis = ST

$(S+4)(T-\frac{1}{2}) = ST$ — (1)

$(S-2)(T+\frac{1}{3}) = ST$ — (2)

Let's work out!

P10 Arun covers a certain distance on a toy train. If the train moved 4 km/h faster, it would take 30 min less to cover the same distance. If it moved 2 km/h slower, it would have taken 20 min more to cover the same distance. Find the distance.

(a) 60km (b) 45km (c) 30km (d) 20km

$ST - \frac{S}{2} + 4T - 2 = ST$

$-S + 8T = 4$ —①

$S - 6T = 2$

$(S+4)(T-\frac{1}{2}) = ST$ —①

$(S-2)(T+\frac{1}{3}) = ST$ —②

$ST + \frac{S}{3} - 2T - \frac{2}{3} = ST$

$S - 6T = 2$ —②

Let's work out!

P10 Arun covers a certain distance on a toy train. If the train moved 4 km/h faster, it would take 30 min less to cover the same distance. If it moved 2 km/h slower, it would have taken 20 min more to cover the same distance. Find the distance.

(a) 60km (b) 45km (c) 30km (d) 20km

$ST - \frac{S}{2} + 4T - 2 = ST$

$-S + 8T = 4$ — (1)

$S - 6T = 2$

$2T = 6$

$T = 3hr$

$S =$

$(S+4)(T-\frac{1}{2}) = ST$ — (1)

$(S-2)(T+\frac{1}{3}) = ST$ — (2)

$ST + \frac{S}{3} - 2T - \frac{2}{3} = ST$

$S - 6T = 2$ — (2)

Let's work out!

P10 Arun covers a certain distance on a toy train. If the train moved 4 km/h faster, it would take 30 min less to cover the same distance. If it moved 2 km/h slower, it would have taken 20 min more to cover the same distance. Find the distance.

(a) 60km (b) 45km (c) 30km (d) 20km

$ST - \frac{S}{2} + 4T - 2 = ST$

$-S + 8T = 4$ — (1)

$S - 6T = 2$

$2T = 6$

$T = 3hr$

$S = 20 km/hr$

$D = S$

$(S+4)(T-\frac{1}{2}) = ST$ — (1)

$(S-2)(T+\frac{1}{3}) = ST$ — (2)

$ST + \frac{S}{3} - 2T - \frac{2}{3} = ST$

$S - 6T = 2$ — (2)

Let's work out!

P10 Arun covers a certain distance on a toy train. If the train moved 4 km/h faster, it would take 30 min less to cover the same distance. If it moved 2 km/h slower, it would have taken 20 min more to cover the same distance. Find the distance.

(a) 60km (b) 45km (c) 30km (d) 20km

$ST - \frac{S}{2} + 4T - 2 = ST$

$-S + 8T = 4$ — (1)

$S - 6T = 2$

$2T = 6$

$T = 3hr$

$S = 20 km/hr$

$D = S \times T$

$= 20 \times 3$

$= 60km$

$(S+4)(T-\frac{1}{2}) = ST$ — (1)

$(S-2)(T+\frac{1}{3}) = ST$ — (2)

$ST + \frac{S}{3} - 2T - \frac{2}{3} = ST$

$S - 6T = 2$ — (2)

Let's work out!

$\frac{4}{5}S$

$\frac{4}{5} \times S = 40$ (10)

$S = 50$

P11 The average speed of a train is 20% less on the return journey than during the forward journey. The train halts for half an hour at the destination station before starting on the return journey. If the total time taken for complete (forward and back) journey is 23 h, covering a distance of 1000 km, the speed of the train on the return journey is ___?

(a) 60 kmph (b) 40 kmph (c) 50 kmph (d) 55 kmph

$22\frac{1}{2} = \frac{45}{2}$

$T = \frac{500}{S}$

$T_2 = \frac{500}{\frac{4}{5}S}$

$T_1 + T_2 = T$

$\frac{500}{S_{10}} + \frac{500}{\frac{4}{5}S} = \frac{45}{2}$

$\Rightarrow \frac{500}{50} + \frac{500}{40} =$

$10 + \frac{25}{2} = \frac{45}{2}$

Let's work out!

P12 Two trains move from station Utarlai and station Pathankot towards each other at the speed of 50 km/h and 60 km/h respectively. At the meeting point, the driver of the second train felt that the train has covered 120 km more than the first train. What is the distance between Utarlai and Pathankot?

(a) 1320km (b) 1100km (c) 900km (d) 1000km

$T_1 = T_2$

$\frac{x}{50} = \frac{x+120}{60}$

$\Rightarrow 6x = 5x + 600$

$\Rightarrow x = 600$

$D = x + (x + 120)$

$D = 600 \times 2 + 120$

$= 1320$

Let's work out!

P12 Two trains move from station Utarlai and station Pathankot towards each other at the speed of 50 km/h and 60 km/h respectively. At the meeting point, the driver of the second train felt that the train has covered 120 km more than the first train. What is the distance between Utarlai and Pathankot?

(a) 1320km (b) 1100km (c) 900km (d) 1000km

$T_1 = T_2$

$\frac{x}{50} = \frac{x+120}{60}$

$\Rightarrow 6x = 5x + 600$

$\rightarrow x = 600$

$D = x + (x + 120)$

$D = 600 \times 2 + 120$

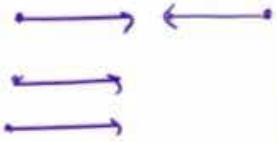
$= 1320$

Let's work out!

P13 The length of a train and that of a platform are equal. If with a speed of 90 km/h, the train crosses the platform in one minute, then the length of the train (in meters) is:

(a) 500 (b) 600 (c) 750 (d) 900

Relative



$S_A + S_B$ ✓

$|S_A - S_B|$ ✓

$\text{Speed} = \frac{L_T + L_P}{\text{Total time}}$

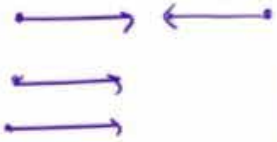
Speed

Let's work out!

P13 The length of a train and that of a platform are equal. If with a speed of 90 km/h, the train crosses the platform in one minute, then the length of the train (in meters) is:

(a) 500 (b) 600 (c) 750 (d) 900

Relative



$S_A + S_B$ ✓

$|S_A - S_B|$ ✓

Speed when one $= \frac{L_T + L_P}{\text{Total time}}$

Speed (relative) for trains $= \frac{L_{T_1} + L_{T_2}}{\text{Total time}}$

Let's work out!

P13 The length of a train and that of a platform are equal. If with a speed of 90 km/h, the train crosses the platform in one minute, then the length of the train (in meters) is:

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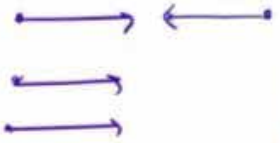
Relative



$S_A + S_B$ ✓

$|S_A - S_B|$ ✓

Speed $= \frac{L_T + L_p}{\text{Total time}}$

when one moving other is stationary

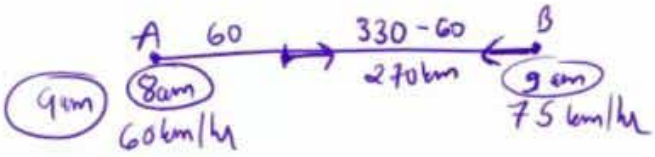
Speed (relative) $= \frac{L_{T_1} + L_{T_2}}{\text{Total time}}$

for trains

Let's work out!

P14 The distance between two cities A and B is 330 km. A train starts from A at 8 am and travels towards B at 60 km/hr. Another train start from B at 9 am and travels towards A at 75 km/hr. At what time do they meet?

(a) 10am (b) 10.30am (c) 11am (d) 1pm



$$135 = \frac{270}{t}$$

$$\Rightarrow t = 2 \text{ hr}$$

Let's work out!

P19 In a kilometer race, A beats B by 10 m. In a two kilometers race, A beats B by

(a) 10 m (b) 20 m (c) 40 m (d) 25 m

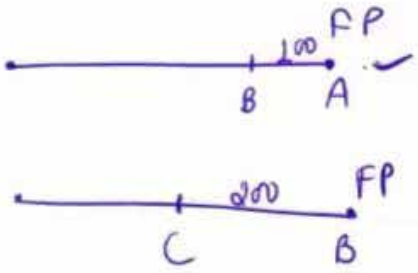
A = 1000 m
B = 990 m

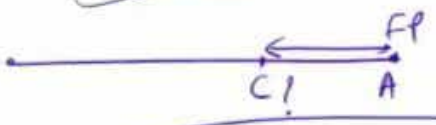
2000
1980
20 m

Let's work out!

P15 In a kilometer race, Amit beats Bahadur by 100 m and Bahadur beats Chandra by 200 m. By how many metres does Amit beat Chandra in the same race?

(a) 100 m (b) 83(1/3) m (c) 68 m (d) 280 m





C = 720

A = 1000 B = 900

B = 1000 C = 800

B = 900 C = ? $\frac{800}{1000} \times 900 = 720$

Let's work out!

P17 On an escalator, it took me 30 seconds and 36 steps to reach bottom. However if I'm able to step down 44 stairs I would only require 24 seconds to go to bottom. How many steps are there when escalator is idle?

(a) 40 (b)76 (c) None of (a) & (b) (d) Indeterminable

30 sec 36 steps

$\frac{30}{3/4} + 36 =$

Step diff = 44 − 36

= 8

time diff = 6 sec

Time taken for 1 step = $\frac{6}{8}\left(\frac{3}{4}\right)$

Let's work out!

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Step diff = 44 − 36
= 8

time diff = 6 sec

30 sec → 36 steps

$\frac{30}{3/4} + 36$

$= 76$

Time taken for 1 step = $\frac{6}{8}\left(\frac{3}{4}\right)$

Let's work out!

P18 A car travels from Patna to Jehanabad at a speed of 65 km/h in one hour. If the speed is reduced by 15 km/h then, how much more time will the car take to cover the same distance?

(a) 12 min (b) 16 min (c) 18 min (d) 44 min

$$\frac{65^{13}}{50} = \frac{t}{60}$$

$$t = 78$$

$$= 18 \text{ min}$$

Let's work out!

P20 Two persons are walking with the speed A and B respectively. If the first person takes ten min less to cover a distance, what is the time taken by the second person to cover the same distance provided A: B = 3:2?

(a) 20 min (b) 30 min (c) 10 min (d) 50 min

$$\frac{3}{2} = \frac{t}{t-10}$$

$$\Rightarrow 3t - 30 = 2t$$

$$\Rightarrow t = 30 \text{ min}$$

Clarifications?

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

When Time is const

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

When Dis is const

$$\boxed{\frac{S_1}{S_2} = \frac{T_2}{T_1}}$$

Clarifications?

★ $S = \frac{D}{T}$

When Time is const

★ $\frac{S_1}{S_2} = \frac{D_1}{D_2}$

When D is is const

★ $\boxed{\frac{S_1}{S_2} = \frac{T_2}{T_1}}$

★ Relative Speed.

When object are moving in same direction = $|S_A - S_B|$

When opp = $S_A + S_B$

Question on trains

★ Crossing platform / bridge

Speed(Tr) = $\frac{L_T + L_P}{\text{Total Time}}$

★ Trains crossing each other

$S_{(relative)} = \frac{L_{T_1} + L_{T_2}}{\text{Total Time}}$

Clarifications?

★ $S = \frac{D}{T}$

When Time is const

★ $\frac{S_1}{S_2} = \frac{D_1}{D_2}$

When Dis is const

★ $\boxed{\frac{S_1}{S_2} = \frac{T_2}{T_1}}$

★ Relative Speed.

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