1. A man takes 5 hours 45 min in walking to a certain place and riding back. He would have gained 2 hours by riding both ways. The time he would take to walk both ways is

A. 11 hrs

B. 8 hrs 45 min

C. 7 hrs 45 min

D. 9 hts 20 min

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Here is the answer and explanation

Answer : Option C

Explanation :

Solution 1

Given that time taken for riding both ways will be 2 hours lesser than

the time needed for waking one way and riding back

From this, we can understand that

time needed for riding one way = time needed for waking one way - 2 hours

Given that time taken in walking one way and riding back = 5 hours 45 min

Hence The time he would take to walk both ways = 5 hours 45 min + 2 hours = 7 hours 45 min

In fact, you can do all these calculations mentally and save a lot of time

which will be a real benefit for you.

Solution 2

Let the distance be x km. Then

(Time taken to walk x km) + (Time taken to ride x km) = 5 hour 45 min

$= 5\frac{45}{60}$ hour $= 5\frac{3}{4}$ hour $= \frac{23}{4}$ hour .....(Equation1)

(Time taken to ride 2x km) = 5 hour 45 min - 2 = 3 hour 45 min

$= 3\frac{45}{60}$ hour $= 3\frac{3}{4}$ hour $= \frac{15}{4}$ hour .....(Equation2)

Solving equations 1 and 2

(Equation 1) $\times$ 2 $\Rightarrow$ (Time taken to walk 2x km)+ (Time taken to ride 2x km) = $\frac{23}{2}$ hour .....(Equation3)

(Equation 3 - Equation 2) $\Rightarrow$ Time taken to walk 2x km $= \frac{23}{2} - \frac{15}{4}$

$= \frac{46}{4} - \frac{15}{4} = \frac{31}{4}$ hours $= 7\frac{3}{4}$ hours = 7 hours 45 minutes

2. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

A. 8.2 B. 4.2

C. 6.1 D. 7.2

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

distance = 600 meter

time = 5 minutes = 5 x 60 seconds = 300 seconds

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{600}{300} = 2\text{m/s}$$

$$= 2 \times \frac{18}{5}\ \text{km/hr} = \frac{36}{5}\ \text{km/hr} = 7.2\ \text{km/hr}$$

3. Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?

A. 12

B. 11

C. 10

D. 9

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

speed of the bus excluding stoppages = 54 kmph

speed of the bus including stoppages = 45 kmph

Loss in speed when including stoppages = 54 - 45 = 9kmph

=> In 1 hour, bus covers 9 km less due to stoppages

Hence, time that the bus stop per hour = time taken to cover 9 km

$$= \frac{\text{distance}}{\text{speed}} = \frac{9}{54}\ \text{hour} = \frac{1}{6}\ \text{hour} = \frac{60}{6}\ \text{min} = 10\ \text{min}$$

4. A man complete a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

A. 121 km

B. 242 km

C. 224 km

D. 112 km

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

distance = speed x time

Let time taken to travel the first half = x hr

then time taken to travel the second half = (10 - x) hr

Distance covered in the the first half = 21x

Distance covered in the the second half = 24(10 - x)

But distance covered in the the first half = Distance covered in the the second half

=> 21x = 24(10 - x)

=> 21x = 240 - 24x

=> 45x = 240

=> 9x = 48

=> 3x = 16

$\Rightarrow x = \frac{16}{3}$

$\text{Hence Distance covered in the the first half} = 21x = 21 \times \frac{16}{3} = 7 \times 16 = 112 \text{ km}$

$\text{Total distance} = 2 \times 112 = 224 \text{ km}$

5. A car traveling with 5/7 of its actual speed covers 42 km in 1 hr 40 min 48 sec. What is the actual speed of the car?

A. 30 km/hr

B. 35 km/hr

C. 25 km/hr

D. 40 km/hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

$\text{Time} = 1 \text{ hr } 40 \text{ min } 48 \text{ sec} = 1\text{hr} + \frac{40}{60} \text{ hr} + \frac{48}{3600} \text{ hr} = 1 + \frac{2}{3} + \frac{1}{75} = \frac{126}{75} \text{ hr}$

$\text{distance} = 42 \text{ km}$

$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{42}{(\frac{126}{75})} = \frac{42 \times 75}{126}$

$\Rightarrow \frac{5}{7} \text{ of the actual speed} = \frac{42 \times 75}{126}$

$\Rightarrow \text{actual speed} = \frac{42 \times 75}{126} \times \frac{7}{5} = \frac{42 \times 15}{18} = \frac{7 \times 15}{3} = 7 \times 5 = 35 \text{ km/hr}$

6. A man covered a certain distance at some speed. If he had moved 3 kmph faster, he would have

taken 40 minutes less. If he had moved 2 kmph slower, he would have taken 40 minutes more. What is the the distance in km?

A. 36

B. 38

C. 40

D. 42

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Let the distance be x km ,

the speed in which he moved = v kmph

Time taken when moving at normal speed - time taken when moving 3 kmph faster = 40 minutes

$$\Rightarrow \frac{x}{v} - \frac{x}{v+3} = \frac{40}{60}$$

$$\Rightarrow x[\frac{1}{v} - \frac{1}{v+3}] = \frac{2}{3}$$

$$\Rightarrow x[\frac{v+3-v}{v(v+3)}] = \frac{2}{3}$$

$$\Rightarrow 2v(v+3) = 9x \text{.....(Equation1)}$$

Time taken when moving 2 kmph slower - Time taken when moving at normal speed = 40 minutes

$\Rightarrow \frac{x}{v-2} - \frac{x}{v} = \frac{40}{60}$

$\Rightarrow x[\frac{1}{v-2} - \frac{1}{v}] = \frac{2}{3}$

$\Rightarrow x[\frac{v-v+2}{v(v-2)}] = \frac{2}{3}$

$\Rightarrow x[\frac{2}{v(v-2)}] = \frac{2}{3}$

$\Rightarrow x[\frac{1}{v(v-2)}] = \frac{1}{3}$

$\Rightarrow v(v-2) = 3x$.....(Equation2)

$\frac{\text{Equation1}}{\text{Equation2}} \Rightarrow \frac{2(v+3)}{(v-2)} = 3$

$\Rightarrow 2v + 6 = 3v - 6$

$\Rightarrow v = 12$

Substituting this value of v in Equation 1 $\Rightarrow 2 \times 12 \times 15 = 9x$

$\Rightarrow x = \frac{2 \times 12 \times 15}{9} = \frac{2 \times 4 \times 15}{3} = 2 \times 4 \times 5 = 40$

Hence distance = 40 km

7. A and B walk around a circular track. A and B walk at a speed of 2 rounds per hour and 3 rounds per hour respectively. If they start at 8 a.m. from the same point in opposite directions, how many times shall they cross each other before 9.30 a.m.?

A. 5

B. 6

C. 7

D. 8

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Here is the answer and explanation

Answer : Option C

Explanation :

Relative speed = Speed of A + Speed of B (∴ they walk in opposite directions)

= 2 + 3 = 5 rounds per hour

=> They cross each other 5 times in 1 hour and 2 times in 1/2 hour

Time duration from 8 am to 9.30 am = 1.5 hour

Hence they cross each other 7 times before 9.30 am

8. Two boys starts from the same place walking at the rate of 5 kmph and 5.5 kmph respectively in the same direction. What time will they take to be 8.5 km apart?

A. 17 hr
B. 14 hr
C. 12 hr
D. 19 hr

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Here is the answer and explanation

Answer : Option A

Explanation :

Relative speed = 5.5 - 5 = .5 kmph (because they walk in the same direction)

distance = 8.5 km

$$\text{time} = \frac{\text{distance}}{\text{speed}} = \frac{8.5}{.5} = 17 \text{ hr}$$

9. In covering a distance of 30 km, Arun takes 2 hours more than Anil. If Arun doubles his speed, then he would take 1 hour less than Anil. What is Arun's speed?

A. 8 kmph
B. 5 kmph
C. 4 kmph
D. 7 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Let the speed of Arun = x kmph

and the speed of Anil = y kmph

distance = 30 km

We know that $\frac{\text{distance}}{\text{speed}} = \text{time}$

Hence

$\frac{30}{x} - \frac{30}{y} = 2$.....(Equation1)

$\frac{30}{y} - \frac{30}{2x} = 1$.....(Equation2)

Equation1 + Equation2 $\Rightarrow \frac{30}{x} - \frac{30}{2x} = 3$

$\Rightarrow \frac{30}{2x} = 3$

$\Rightarrow \frac{15}{x} = 3$

$\Rightarrow \frac{5}{x} = 1$

$\Rightarrow x = 5$

Hence Arun's speed = 5 kmph

10. A car travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. What is the average speed for the first 320 km of the tour?

A. 70.24 km/hr

B. 74. 24 km/hr

C. 71.11 km/hr

D. 72.21 km/hr

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Here is the answer and explanation

Answer : Option C

Explanation :

Solution 1 (Quick)

If a car covers a certain distance at x kmph and an equal distance at y kmph,

the average speed of the whole journey = $\frac{2xy}{x+y}$ kmph.

By using the same formula, we can find out the average speed quickly

average speed = $\frac{2 \times 64 \times 80}{64+80} = \frac{2 \times 64 \times 80}{144} = \frac{2 \times 32 \times 40}{36}$

$= \frac{2 \times 32 \times 10}{9} = \frac{64 \times 10}{9} = 71.11$ kmph

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Solution 2 (Fundamentals)

Car travels first 160 km at 64 km/hr

Time taken to travel first 160 km = $\frac{\text{distance}}{\text{speed}} = \frac{160}{64}$

Car travels next160 km at 80 km/hr

Time taken to travel next 160 km = $\frac{\text{distance}}{\text{speed}} = \frac{160}{80}$

Total distance traveled = 160 + 160 = 2 × 160

Total time taken = $\frac{160}{64} + \frac{160}{80}$

Average speed = $\frac{\text{Total distance traveled}}{\text{Total time taken}} = \frac{2 \times 160}{\frac{160}{64} + \frac{160}{80}}$

$= \frac{2}{\frac{1}{64} + \frac{1}{80}} = \frac{2 \times 64 \times 80}{80+64} = \frac{2 \times 64 \times 80}{144} = \frac{2 \times 8 \times 80}{18} = \frac{640}{9}$

= 71.11 km/hr

11. A Man travelled a distance of 61 km in 9 hours. He travelled partly on foot at 4 km/hr and partly on bicycle at 9 km/hr. What is the distance travelled on foot?

A. 12 km B. 14 km

C. 16 km D. 18 km

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Here is the answer and explanation

Answer : Option C

Explanation :

Solution 1

Let the time in which he travelled on foot = x hr

Then the time in which he travelled on bicycle = (9 - x) hr

distance = speed x time

$\Rightarrow 4x + 9(9 - x) = 61$

$\Rightarrow 4x + 81 - 9x = 61$

$\Rightarrow 5x = 20$

$\Rightarrow x = 4$

$\Rightarrow$ distance travelled on foot $= 4x = 4 \times 4 = 16$ km

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Solution 2

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let the distance he travelled on foot = x km

Then the distance he travelled on bicycle = (61-x) km

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\Rightarrow \frac{x}{4} + \frac{(61 - x)}{9} = 9$$

$$\Rightarrow 9x + 4 \times 61 - 4x = 36 \times 9$$

$$\Rightarrow 5x + 244 = 324$$

$$\Rightarrow 5x = 324 - 244 = 80$$

$$\Rightarrow x = \frac{80}{5} = 16 \text{ km}$$

12. Walking 6/7th of his usual speed, a man is 12 minutes too late. What is the usual time taken by

him to cover that distance?

A. 1 hr 42 min
B. 1 hr
C. 2 hr
D. 1 hr 12 min

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Here is the answer and explanation

Answer : Option D

Explanation :

New speed = 6/7 of usual speed

Speed and time are inversely proportional.

Hence new time = 7/6 of usual time

Hence, 7/6 of usual time - usual time = 12 minutes

=> 1/6 of usual time = 12 minutes

=> usual time = 12 x 6 = 72 minutes = 1 hour 12 minutes

13. A man goes to his office from his house at a speed of 3 km/hr and returns at a speed of 2 km/hr. If he takes 5 hours in going and coming, what is the distance between his house and office?

A. 3 km
B. 4 km
C. 5 km
D. 6 km

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Here is the answer and explanation

Answer : Option D

Explanation :

If a car covers a certain distance at x kmph and an equal distance at y kmph, the average speed of the whole journey = $\frac{2xy}{x+y}$ kmph

Hence, average speed = $\frac{2 \times 3 \times 2}{2+3} = \frac{12}{5}$ km/hr

Total time taken = 5 hours

$\Rightarrow$ Distance travelled = $\frac{12}{5} \times 5 = 12$ km

$\Rightarrow$ Distance between his house and office = $\frac{12}{2} = 6$ km

14. A man rides his bicycle 10 km at an average speed of 12 km/hr and again travels 12 km at an average speed of 10 km/hr. What is his average speed for the entire trip approximately?

A. 11.2 kmph
B. 10 kmph

C. 10.2 kmph D. 10.8 kmph

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Here is the answer and explanation

Answer : Option D

Explanation :

Total distance travelled = 10 + 12 = 22 km

$$\text{Time taken to travel 10 km at an average speed of 12 km/hr} = \frac{\text{distance}}{\text{speed}} = \frac{10}{12} \text{ hr}$$

$$\text{Time taken to travel 12 km at an average speed of 10 km/hr} = \frac{\text{distance}}{\text{speed}} = \frac{12}{10} \text{ hr}$$

$$\text{Total time taken} = \frac{10}{12} + \frac{12}{10} \text{ hr}$$

$$\text{Average speed} = \frac{\text{distance}}{\text{time}} = \frac{22}{(\frac{10}{12} + \frac{12}{10})} = \frac{22 \times 120}{(10 \times 10) + (12 \times 12)}$$

$$\frac{22 \times 120}{244} = \frac{11 \times 120}{122} = \frac{11 \times 60}{61} = \frac{660}{61} \approx 10.8 \text{ kmph}$$

15. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in $1\frac{2}{3}$ hours, it must travel at a speed of:

A. 660 km/hr B. 680 km/hr

C. 700 km/hr D. 720 km/hr

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Here is the answer and explanation

Answer : Option D

Explanation :

Solution 1 (Recommended)

Speed and time are inversely proportional

$\Rightarrow \text{Speed} \propto \frac{1}{\text{Time}}$ (when distance is constant)

Here distance is constant and Speed and time are inversely proportional

$$\text{Speed} \propto \frac{1}{\text{Time}}$$

$$\Rightarrow \frac{\text{Speed1}}{\text{Speed2}} = \frac{\text{Time2}}{\text{Time1}}$$

$$\Rightarrow \frac{240}{\text{Speed2}} = \frac{(1\frac{2}{3})}{5}$$

$$\Rightarrow \frac{240}{\text{Speed2}} = \frac{(\frac{5}{3})}{5}$$

$$\Rightarrow \frac{240}{\text{Speed2}} = \frac{1}{3}$$

$$\Rightarrow \text{Speed2} = 240 \times 3 = 720 \text{ km/hr}$$

Solution 2

Distance = Speed x Time = 240 x 5 km

$$\text{New time} = 1\frac{2}{3} \text{ hr} = \frac{5}{3} \text{ hr}$$

$$\text{Hence, new speed} = \frac{\text{Distance}}{\text{Time}} = \frac{240 \times 5}{\frac{5}{3}} = 240 \times 3 = 720 \text{ km/hr}$$

16. A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. What is the speed of the car?

A. 80 kmph

B. 102 kmph

C. 120 kmph

D. 140 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Let speed of the car = x kmph

Then speed of the train = $\frac{(100 + 50)}{100}$ x = $\frac{150}{100}$ x = $\frac{3}{2}$ x kmph

Time taken by the car to travel from A to B = $\frac{75}{x}$ hours

Time taken by the train to travel from A to B = $\frac{75}{(\frac{3}{2} x)} + \frac{12.5}{60}$ hours

Since Both start from A at the same time and reach point B at the same time

$$\frac{75}{x} = \frac{75}{(\frac{3}{2} x)} + \frac{12.5}{60}$$

$$\frac{25}{x} = \frac{12.5}{60}$$

$$x = \frac{25 \times 60}{12.5} = 2 \times 60 = 120$$

17. In a flight of 600 km, an aircraft was slowed down due to bad weather. Its average speed for the trip was reduced by 200 km/hr and the time of flight increased by 30 minutes. What is the duration of the flight ?

A. 2 hour

B. $1\frac{1}{2}$ hour

C. $\frac{1}{2}$ hour

D. 1 hour

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option D

Explanation :

Let the duration of the flight = x hours

Given that distance = 600 km

Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{600}{x}$ .....(Equation1)

Duration of the flight due to the slow down = $(x + \frac{30}{60})$ hours = $(x + \frac{1}{2})$ hours

New speed = $\frac{600}{(x + \frac{1}{2})}$ .....(Equation2)

From Equations 1 and 2, Reduction in Speed = $\frac{600}{x} - \frac{600}{(x + \frac{1}{2})}$

Given that Reduction in average speed =200 km/hr

$\Rightarrow \frac{600}{x} - \frac{600}{(x + \frac{1}{2})} = 200$

$\Rightarrow \frac{3}{x} - \frac{3}{(x + \frac{1}{2})} = 1$

$\Rightarrow \frac{3}{x} - \frac{6}{2x + 1} = 1$

$\Rightarrow \frac{3(2x + 1) - 6x}{x(2x + 1)} = 1$

$\Rightarrow \frac{6x + 3 - 6x}{x(2x + 1)} = 1$

$\Rightarrow \frac{3}{x(2x + 1)} = 1$

$\Rightarrow 2x^2 + x - 3 = 0$.....(Equation3)

From here, you can get the answer using Trial and error method.
If you try with the values given as the choices, you can see the value of x = 1 satisfies the equation 3. Hence answer is 1 hour

Or, we can solve the equation 3 to get the answer

$\Rightarrow 2x^2 + x - 3 = 0$

$\Rightarrow (2x + 3)(x - 1) = 0$

$\Rightarrow x = 1$(Removing the -ve value for x)

Hence answer is 1 hour

18. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. What is the actual distance travelled by him?

A. 80 km
B. 70 km
C. 60 km
D. 50 km

Here is the answer and explanation

Answer : Option D

Explanation :

Assume that the person would have covered x km if travelled at 10 km/hr

$$\Rightarrow \text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{x}{10} \text{ .....(Equation1)}$$

Give that the person would have covered (x + 20) km if travelled at 14 km/hr

$$\Rightarrow \text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{(x+20)}{14} \text{ .....(Equation2)}$$

From Equations 1 and 2,

$$\frac{x}{10} = \frac{(x+20)}{14}$$

$$14x = 10x + 200$$

$$4x = 200$$

$$x = \frac{200}{4} = 50$$

19. The ratio between the speeds of two trains is 7 : 8. If the second train runs 400 km in 4 hours, What is the the speed of the first train?

A. 85 km/hr

B. 87.5 km/hr

C. 90 km/hr

D. 92.5 km/hr

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Solution 1 (Recommended)

Speed and time are inversely proportional (when distance is constant)

$$\Rightarrow \text{Speed} \propto \frac{1}{\text{Time}} \text{ (when distance is constant)}$$

Here distance is constant and hence speed and time are inversely proportional

$$\text{Speed} \propto \frac{1}{\text{Time}}$$

$$\Rightarrow \frac{\text{Speed1}}{\text{Speed2}} = \frac{\text{Time2}}{\text{Time1}}$$

$$\Rightarrow \frac{7}{8} = \frac{4}{\text{Time1}}$$

$$\Rightarrow \text{Time1} = \frac{4 \times 8}{7} \text{ hr}$$

$$\Rightarrow \text{Speed of the first train} = \frac{\text{Distance}}{\text{Time1}} = \frac{400}{(\frac{4 \times 8}{7})}$$

$$= \frac{100 \times 7}{8} = 12.5 \times 7 = 87.5 \text{ km/hr}$$

Solution 2

Since the ratio of the speeds of trains is 7 : 8 , let's assume that

speed of the trains are 7x and 8x respectively.

Given that second train runs 400 km in 4 hours.

$$\Rightarrow \text{Speed of the 2nd train} = \frac{\text{Distance}}{\text{Time}} = \frac{400}{4} = 100 \text{ km/hr}$$

$$\Rightarrow 8x = 100$$

$$\Rightarrow x = \frac{100}{8} = 12.5$$

$$\Rightarrow \text{Speed of the first train} = 7x = 7 \times 12.5 = 87.5 \text{ km/hr}$$

20. It takes eight hours for a 600 km journey, if 120 km is done by train and the rest by car. It takes 20 minutes more, if 200 km is done by train and the rest by car. What is the ratio of the speed of the train to that of the car?

A. 3 : 4

B. 2 : 3

C. 1 : 2

D. 1 : 3

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option A

Explanation :

Let speed of the train = x kmph and speed of the car = y kmph

Time needed for traveling 600 km if 120 km by train and the rest by car = 8 hr

$$\Rightarrow \frac{120}{x} + \frac{(600-120)}{y} = 8$$

$$\Rightarrow \frac{120}{x} + \frac{480}{y} = 8 \text{.....(Equation 1)}$$

$$\Rightarrow \frac{15}{x} + \frac{60}{y} = 1 \text{.....(Equation 1)}$$

Time needed for traveling 600 km if 200 km by train and the rest by car = 8 hr 20 min

$$\Rightarrow \frac{200}{x} + \frac{(600-200)}{y} = 8\frac{20}{60} = 8\frac{1}{3} = \frac{25}{3}$$

$$\Rightarrow \frac{200}{x} + \frac{400}{y} = \frac{25}{3}$$

$$\Rightarrow \frac{8}{x} + \frac{16}{y} = \frac{1}{3}$$

$$\Rightarrow \frac{24}{x} + \frac{48}{y} = 1 \text{.....(Equation 2)}$$

Solving Equation1 and Equation2

Here Equation1 = Equation2 = 1

$$\Rightarrow \frac{15}{x} + \frac{60}{y} = \frac{24}{x} + \frac{48}{y}$$

$$\Rightarrow \frac{12}{y} = \frac{9}{x}$$

$$\Rightarrow \frac{4}{y} = \frac{3}{x}$$

$$\Rightarrow \frac{x}{y} = \frac{3}{4}$$

$$\Rightarrow x : y = 3 : 4$$

21. Arun is traveling on his cycle and has calculated to reach point A at 2 pm if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 pm?

A. 8 kmph

B. 10 kmph

C. 12 kmph

D. 14 kmph

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option C

Explanation :

Let the distance be x km

if travels at 10 kmph, Arun will reach point A at 2 pm

if travels at 15 kmph, Arun will reach point 12 noon

=> Time taken when traveling at 10 km = Time taken when traveling at 15 km + 2 hours

$$\Rightarrow \frac{x}{10} = \frac{x}{15} + 2$$

$$\Rightarrow \frac{x}{10} - \frac{x}{15} = 2$$

$$\Rightarrow 3x - 2x = 2 \times 30$$

$$\Rightarrow x = 60$$

$$\Rightarrow \text{Distance} = 60 \text{ km}$$

Examine the any statement say, if travels at 10 kmph, Arun will reach point A at 2 pm

$$\Rightarrow \text{Time taken} = \frac{\text{Distance}}{\text{Speed}} = \frac{60}{10} = 6 \text{ hours}$$

$$\Rightarrow \text{He must have started 6 hours back 2 pm, ie, at 8 am}$$

$$\Rightarrow \text{Now he wants to reach at 1 pm. ie; time to be taken} = 5 \text{ hours}$$

$$\Rightarrow \text{Speed needed} = \frac{\text{Distance}}{\text{Time}} = \frac{60}{5} = 12 \text{ kmph}$$

22. A car travels at an average of 50 miles per hour for $2\frac{1}{2}$ hours and then travels at a speed of 70

miles per hour for $1\frac{1}{2}$ hours. How far did the car travel in the entire 4 hours?

A. 210 miles
B. 230 miles
C. 250 miles
D. 260 miles

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

$$\text{Speed1} = 50 \text{ miles/hour}$$

$$\text{Time1} = 2\frac{1}{2} \text{ hour} = \frac{5}{2} \text{ hour}$$

$$\text{Distance1} = \text{Speed1} \times \text{Time1} = 50 \times \frac{5}{2} = 25 \times 5 = 125 \text{ miles}$$

$$\text{Speed2} = 70 \text{ miles/hour}$$

$$\text{Time2} = 1\frac{1}{2} \text{ hour} = \frac{3}{2} \text{ hour}$$

$$\text{Distance2} = \text{Speed2} \times \text{Time2} = 70 \times \frac{3}{2} = 35 \times 3 = 105 \text{ miles}$$

$$\text{Total Distance} = \text{Distance1} + \text{Distance2} = 125 + 105 = 230 \text{ miles}$$

23. The speed of a bus increases by 2 km after every one hour. If the distance travelling in the first one hour was 35 km. what was the total distance travelled in 12 hours?

A. 422 km
B. 552 km
C. 502 km
D. 492 km

Hide Answer | Notebook | Discuss

Here is the answer and explanation

Answer : Option B

Explanation :

Given that distance travelled in 1st hour = 35 km

and speed of the bus increases by 2 km after every one hour

Hence distance travelled in 2nd hour = 37 km

Hence distance travelled in 3rd hour = 39 km

...

Total Distance Travelled = [35 + 37 + 39 + ... (12 terms)]

This is an Arithmetic Progression(AP) with

first term, a=35, number of terms,n = 12 and common difference, d=2.

The sequence a , (a + d), (a + 2d), (a + 3d), (a + 4d), . . .
is called an Arithmetic Progression(AP)
where a is the first term and d is the common difference of the AP

Sum of the first n terms of an Arithmetic Progression(AP),

$S_n = \frac{n}{2}[2a + (n-1)d]$

where n = number of terms

Hence, $[35 + 37 + 39 + \ldots (12 \text{ terms})]$

$= S_{12} = \frac{12}{2}[2 \times 35 + (12-1)2]$

$= 6[70 + 22] = 6 \times 92 = 552$

Hence the total distance travelled = 552 km

24. Sound is said to travel in air at about 1100 feet per second. A man hears the axe striking the tree, $^{11}/_{5}$ seconds after he sees it strike the tree. How far is the man from the wood chopper?

A. 1800 ft
B. 2810 ft
C. 3020 ft
D. 2420 ft

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Here is the answer and explanation

Answer : Option D

Explanation :

Speed of the sound = 1100 ft/s

Time = $^{11}/_{5}$ second

$\text{Distance} = \text{Speed} \times \text{Time} = 1100 \times \frac{11}{5} = 220 \times 11 = 2420 \text{ ft}$

25. An athlete runs 200 metres race in 24 seconds. What is his speed?

A. 20 km/hr
B. 25 km/hr
C. 27.5 km/hr
D. 30 km/hr

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Here is the answer and explanation

Answer : Option D

Explanation :

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{200}{24}\ \text{m/s} = \frac{200}{24} \times \frac{18}{5}\ \text{km/hr}$$

$$= \frac{40 \times 3}{4}\ \text{km/hr} = 10 \times 3\ \text{km/hr} = 30\ \text{km/hr}$$

26. A train is moving at the speed of 80 km/hr. What is its speed in metres per second?

A. $22\frac{2}{9}$ m/s

B. 22 m/s

C. $21\frac{1}{9}$ m/sec

D. 21 m/s

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Here is the answer and explanation

Answer : Option A

Explanation :

$$\text{Speed} = 80\ \text{km/hr} = 80 \times \frac{5}{18}\ \text{m/s} = 40 \times \frac{5}{9}\ \text{m/s} = \frac{200}{9}\ \text{m/s} = 22\frac{2}{9}\ \text{m/s}$$

27. The distance between two cities A and B is 330 km. A train starts from A at 8 a.m. and travel towards B at 60 km/hr. Another train starts from B at 9 a.m. and travels towards A at 75 Km/hr. At what time will they meet?

A. 10.30 a.m.

B. 10 a.m.

C. 12 noon

D. 11 a.m.

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Here is the answer and explanation

Answer : Option D

Explanation :

Assume that they meet x hours after 8 a.m.

Then, train1,starting from A , travelling towards B, travels x hours till the trains meet

$\Rightarrow$ Distance travelled by train1 in x hours = Speed $\times$ Time = $60x$

Then, train2, starting from B , travelling towards A, travels (x-1) hours till the trains meet

$\Rightarrow$ Distance travelled by train2 in (x-1) hours = Speed $\times$ Time = $75(x-1)$

Total distance travelled = Distance travelled by train1 + Distance travelled by train2

=> 330 = 60x + 75(x-1)

=> 12x + 15(x-1) = 66

=> 12x + 15x - 15 = 66

=> 27x = 66 + 15 = 81

=> 3x = 9

=> x = 3

Hence the trains meet 3 hours after 8 a.m., i.e. at 11 a.m.

28. A man walking at the rate of 5 km/hr crosses a bridge in 15 minutes. What is the length of the bridge (in metres)?

A. 1250 B. 1280

C. 1320 D. 1340

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Here is the answer and explanation

Answer : Option A

Explanation :

$$\text{Speed} = 5 \text{ km/hr}$$

$$\text{Time} = 15 \text{ minutes} = \frac{1}{4} \text{ hour}$$

$$\text{Length of the bridge} = \text{Distance Travelled by the man} = \text{Speed} \times \text{Time} = 5 \times \frac{1}{4} \text{ km}$$

$$= 5 \times \frac{1}{4} \times 1000 \text{ metre} = 1250 \text{ metre}$$

29. A train travelled at an average speed of 100 km/hr, stopping for 3 minutes after every 75 km. How long did it take to reach its destination 600 km from the starting point?

A. 6 hrs 21 min B. 7 hrs 14 min

C. 7 hrs 22 min D. 6 hrs

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Here is the answer and explanation

Answer : Option A

Explanation :

Time taken to travel 600 km = $\frac{\text{Distance}}{\text{Speed}} = \frac{600}{100} = 6$ hour

Now we need to find out the number of stops in the 600 km travel. Given that train stops after every 75 km.

$\frac{600}{75} = 8$

It means train stops 7 times before 600 km and 1 time just after 600 km. Hence we need to take only 7 stops into consideration for the 600 km travel.

Hence, total stopping time in the 600 km travel = 7 x 3 = 21 minutes

Total time needed to reach the destination = 6 hours + 21 minutes = 6 hrs 21 min

30. A person travels from A to B at a speed of 40 km/hr and returns by increasing his speed by 50%. What is his average speed for both the trips?

A. 60 km/hr
B. 56 km/hr
C. 52 km/hr
D. 48 km/hr

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Here is the answer and explanation

Answer : Option D

Explanation :

Solution 1 (Quick)

If a car covers a certain distance at x kmph and an equal distance at y kmph, the average speed of the whole journey = $\frac{2xy}{x+y}$ kmph.

By using the same formula, we can find out the average speed quickly
Speed with which he travels from A to B = x = 40 km/hr

Speed with which he travels from B to A = $x = 40 \times \frac{(100+50)}{100} = 60$ km/hr

average speed = $\frac{2 \times 40 \times 60}{40+60} = 48$ km/hr

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Solution 2 (Fundamentals)

Assume that distance from A to B = x km

Speed with which he travels from A to B = x = 40 km/hr

$$\text{Time to travel from A to B} = \frac{\text{distance}}{\text{speed}} = \frac{x}{40} \text{ hr}$$

$$\text{Speed with which he travels from B to A} = 40 \times \frac{(100 + 50)}{100} = 60 \text{ km/hr}$$

$$\text{Time to travel from B to A} = \frac{\text{distance}}{\text{speed}} = \frac{x}{60}$$

$$\text{Total distance traveled} = x + x = 2x$$

$$\text{Total time taken} = \frac{x}{40} + \frac{x}{60}$$

$$\text{Average speed} = \frac{\text{Total distance traveled}}{\text{Total time taken}} = \frac{2x}{\frac{x}{44} + \frac{x}{60}}$$

$$= \frac{2}{\frac{1}{60} + \frac{1}{40}} = \frac{2 \times 2400}{40 + 60} = 2 \times 24 = 48 \text{ km/hr}$$

31. A man in a train notices that he can count 21 telephone posts in one minute. If they are known to be 50 metres apart, at what speed is the train travelling?

A. 61 km/hr

B. 56 km/hr

C. 63 km/hr

D. 60 km/hr

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Here is the answer and explanation

Answer : Option D

Explanation :

The man in the train notices that he can count 21 telephone posts in one minute.

Number of gaps between 21 posts are 20 and Two posts are 50 metres apart.

It means 20 x 50 meters are covered in 1 minute.

Distance = 20×50 meter = $\frac{20 \times 50}{1000}$ km = 1 km

Time = 1 minute = $\frac{1}{60}$ hour

Speed = $\frac{\text{Distance}}{\text{Time}} = \frac{1}{(\frac{1}{60})} = 60$ km/hr

32. A truck covers a distance of 550 metres in 1 minute whereas a train covers a distance of 33 kms in 45 minutes. What is the ratio of their speed?

A. 2 : 1

B. 1 : 2

C. 4 : 3

D. 3 : 4

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Here is the answer and explanation

Answer : Option D

Explanation :

Speed of the truck = $\frac{\text{Distance}}{\text{Time}} = \frac{550}{1} = 550$ meters/minute

Speed of the train = $\frac{\text{Distance}}{\text{Time}} = \frac{33}{45}$ km/minute = $\frac{33000}{45}$ meters/minute

$\frac{\text{Speed of the truck}}{\text{Speed of the train}} = \frac{550}{(\frac{33000}{45})} = \frac{550 \times 45}{33000} = \frac{55 \times 45}{3300}$

$= \frac{11 \times 45}{660} = \frac{11 \times 9}{132} = \frac{9}{12} = \frac{3}{4}$

Hence, Speed of the truck : Speed of the train = 3 : 4

33. A person has to cover a distance of 6 km in 45 minutes. If he covers one-half of the distance in two-thirds of the total time; to cover the remaining distance in the remaining time, what should be his speed in km/hr?

A. 14 km/hr

B. 12 km/hr

C. 10 km/hr

D. 8 km/hr

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Here is the answer and explanation

Answer : Option B

Explanation :

The person needs to cover 6 km in 45 minutes

Given that he covers one-half of the distance in two-thirds of the total time

=> He covers half of 6 km in two-thirds of 45 minutes

=> He covers 3 km in 30 minutes

Hence, now he need to cover the remaining 3 km in the remaining 15 minutes

Distance = 3 km

Time = 15 minutes = 1/4 hour

$$\text{Required Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{3}{(\frac{1}{4})} = 12 \text{ km/hr}$$