

### **Problems on Time and Distance - Solved Examples (Set 1)**

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

hrs 20

min

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with 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.

Therefore,

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

---

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 =  $2\frac{3}{4}$  hour  $\dots(1)$

Time taken to ride  $2x$  km

= 5 hour 45 min - 2 hour

= 3 hour 45 min =  $3\frac{45}{60}$  hour

=  $3\frac{3}{4}$  hour =  $1\frac{5}{4}$  hour  $\dots(2)$

Solving (1) and (2)

$$(1) \times 2 \Rightarrow$$

Time taken to walk  $2x$  km + Time taken to ride  $2x$  km = 232 hour  $\dots(3)$

$$(3) - (2) \Rightarrow$$

Time taken to walk  $2x$  km

$$= (232 - 154) = (464 - 154)$$

$$= 314 = 734 \text{ hours} = 7 \text{ hours } 45$$

minutes

2. A person crosses a 600 metre 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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Solution 1 Distance = 600

metre = 0.6 km

Time = 5 minutes =  $\frac{1}{12}$  hour

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{0.6}{\frac{1}{12}} = 7.2 \text{ km/hr}$$

---

Solution 2 Distance = 600 metre

Time = 5 minutes =  $5 \times 60$  seconds = 300 seconds

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{600}{300} = 2 \text{ m/s} = 2 \times 185 \text{ km/hr} = 365 \text{ km/hr} = 7.2 \text{ km/hr}$$

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](#)

| [Discuss](#)

[Notebook](#)

answer with 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 =  $54 - 45 = 9$  kmph

⇒ In 1 hour, bus covers 9 km less due to stoppages.

Hence, time in which the bus stops per hour

= Time taken to cover 9 km

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

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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option C

Explanation:

Solution 1 [reference: formula 4](#)

Average Speed =  $\frac{2 \times 21 \times 24}{21 + 24} = 22.4$  km/hr

Total distance =  $22.4 \times 10 = 224$  km

---

Solution  $2\text{distance} = \text{speed} \times \text{time}$

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 first half  $=21x$

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

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

$\Rightarrow 21x = 24(10-x) \Rightarrow 21x = 240 - 24x \Rightarrow 45x = 240 \Rightarrow 9x = 48 \Rightarrow 3x = 16 \Rightarrow x = \frac{16}{3}$  Hence, distance covered in the first half

$= 21x = 21 \times \frac{16}{3} = 7 \times 16 = 112$  km

Total distance  $= 2 \times 112 = 224$  km

5. A car traveling with  $\frac{5}{7}$  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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option B

Explanation:

time  $= 1$

hr 40 min 48 sec

$= 1 \text{ hr} + \frac{40}{60} \text{ hr} + \frac{48}{3600} \text{ hr}$

$= 1 + \frac{2}{3} + \frac{4}{75} = \frac{1267}{75} \text{ hr}$

distance  $= 42$  km

speed  $= \frac{\text{distance}}{\text{time}} = \frac{42}{\frac{1267}{75}} = 42 \times \frac{75}{1267} = 25 \text{ km/hr}$

$\Rightarrow \frac{5}{7}$  of the actual speed  $= 25$

$\Rightarrow \text{Actual speed} = 25 \times \frac{7}{5} = 35 \text{ km/hr}$

### **Problems on Time and Distance - Solved Examples (Set 2)**

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 distance in km?

- A. 36
- B. 38
- C. 40
- D. 42

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option C

Explanation:

Solution 1 [reference: formula 5.4 - special case](#)

$$\text{speed} = 2v_1 v_2 v_1 - v_2 = 2 \times 3 \times 23 - 2 = 12 \text{ km/hr}$$

$$\text{distance} = vt(1 + \frac{v}{v_1}) = 12 \times 40 \times 60(1 + \frac{12}{23}) = 40 \text{ km}$$

---

Solution 2 Let distance = x km,  
his speed = v kmph

$$\begin{aligned} \text{Time taken when moving at normal speed} - \text{Time taken when moving 3 kmph faster} &= 40 \text{ minutes} \\ \Rightarrow \frac{x}{v} - \frac{x}{v+3} &= 40 \times \frac{60}{60} \Rightarrow x[1v - 1v+3] = 23 \Rightarrow x[v+3 - vv(v+3)] = 23 \Rightarrow 2v(v+3) = 9x \dots (1) \end{aligned}$$

$$\begin{aligned} \text{Time taken when moving 2 kmph slower} - \text{Time taken when moving at normal speed} &= 40 \text{ minutes} \\ \Rightarrow \frac{x}{v-2} - \frac{x}{v} &= 40 \times \frac{60}{60} \Rightarrow x[1v-2-1v] = 23 \Rightarrow x[v-v+2v(v-2)] = 23 \Rightarrow x[2v(v-2)] = 23 \Rightarrow x[1v(v-2)] = 13 \Rightarrow v(v-2) = 3x \dots (2) \end{aligned}$$

$$(1)(2) \Rightarrow 2(v+3)(v-2) = 3 \Rightarrow 2v+6 = 3v-6 \Rightarrow v = 12$$

$$\begin{aligned} \text{Substituting this value of } v \text{ in (1)} \\ \Rightarrow 2 \times 12 \times 15 &= 9x \Rightarrow x = 2 \times 12 \times 159 = 2 \times 4 \times 153 = 2 \times 4 \times 5 = 40 \end{aligned}$$

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option C

Explanation:

Relative speed = Speed of A + Speed of B ( $\because$  they walk in opposite directions)

$= 2 + 3 = 5$

rounds per hour

Therefore, they cross each other 5 times in 1 hour and 2 times in 12 hour

Time duration from 8 a.m. to 9.30 a.m.  $= 1.5$  hour

Hence they cross each other 7 times before 9.30

a.m.

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option A

Explanation:

relative speed  $= 5.5 - 5 = 0.5$

kmph (because they walk in the same direction)  
distance = 8.5 km

time = distance/speed =  $8.5/0.5 = 17$  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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option B

Explanation:

Solution 1 If Arun doubles his speed, he needs 3 hour less. Double speed means half time. Hence, half of the time required by Arun to cover 30 km = 3 hour

i.e., Time required by Arun to cover 30 km = 6 hour

Arun's speed =  $30/6 = 5$  kmph

---

Solution 2 Let speed of Arun = x kmph,  
speed of Anil = y kmph  
distance = 30 km

We know that distance/speed = time. Hence,

$$30/x - 30/y = 2 \dots (1)$$

$$30/y - 30/2x = 1 \dots (2)$$

Adding (1) and (2)

$$30/x - 30/2x = 3 \Rightarrow 30/2x = 3 \Rightarrow 15x = 3 \Rightarrow 5x = 1 \Rightarrow x = 5$$

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option C

Explanation:

Solution 1[reference: formula 4](#)

Average Speed =  $2 \times 64 \times 80 / 64 + 80 = 2 \times 64 \times 80 / 144 = 2 \times 32 \times 40 / 36 = 2 \times 32 \times 10 / 9 = 64 \times 10 / 9 = 71.11$  kmph

---

Solution 2 Car travels first 160 km at 64 km/hr.

Therefore, time taken to travel first 160 km

=  $160 / 64$  hr

Car travels next 160 km at 80 km/hr.

Therefore, time taken to travel next 160 km

=  $160 / 80$  hr

Total distance traveled =  $160 + 160 = 2 \times 160$  km

Total time taken =  $160 / 64 + 160 / 80$  hr

Average speed =  $\frac{\text{Total distance traveled}}{\text{Total time taken}}$

=  $\frac{2 \times 160}{160 / 64 + 160 / 80} = \frac{2160}{160 \times 64 + 160 \times 80} = \frac{2 \times 64 \times 80}{64 + 80} = \frac{2 \times 8 \times 80}{18} = \frac{640}{9} = 71.11$  km/hr



### **Problems on Time and Distance - Solved Examples (Set 3)**

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with 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 × time

$$\Rightarrow 4x + 9(9-x) = 61 \Rightarrow 4x + 81 - 9x = 61 \Rightarrow 5x = 20 \Rightarrow x = 4$$

Distance travelled on foot

$$= 4x = 4 \times 4 = 16 \text{ km}$$

---

Solution 2 Let the distance he travelled on foot = x km

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

$$\text{time} = \frac{\text{distance}}{\text{speed}} \Rightarrow x + \frac{(61-x) \times 9}{9} = 9 \Rightarrow x + 4 \times 61 - 4x = 36 \times 9 \Rightarrow 5x + 244 = 324 \Rightarrow 5x = 324 - 244 = 80 \Rightarrow x = 16 \text{ km}$$

12. Walking  $\frac{6}{7}$ th

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

New speed =  $\frac{6}{7}$

of usual speed

Speed and time are inversely proportional.

Hence new time =  $\frac{7}{6}$  of usual time

Hence,  $\frac{7}{6}$  of usual time - usual time = 12 minutes

$\Rightarrow \frac{1}{6}$  of usual time = 12 minutes

Therefore, usual time =  $12 \times 6 = 72$  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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Solution 1 [reference: formula 4](#)

Average speed =  $\frac{2 \times 3 \times 22 + 3}{22} = 125$  km/hr

Total time taken = 5 hours

Distance travelled =  $125 \times 5 = 12$  km

Therefore, distance between his house and office  
=  $122 = 6$  km

---

Solution 2 Ratio of his speed = 3:2

Therefore, ratio of the time taken = 2:3

Since total time taken is 5 hours, he has taken 2 hours to travel to his office and 3 hours to come back.

Distance between his house and office  
=  $2 \times 3 = 6$

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Total distance travelled  
=  $10 + 12 = 22$  km

Time taken to travel 10 km at an average speed of 12 km/hr  
=  $10/12$  hr

Time taken to travel 12 km at an average speed of 10 km/hr  
=  $12/10$  hr

Total time taken =  $10/12 + 12/10$  hr

$$\text{Average speed} = \frac{\text{Total distance travelled}}{\text{Total time}}$$

taken=221012+1210=22×12010×10+12×12=22×120244=11×120122=11×6061=66061≈10.8 kmph

15. An aeroplane covers a certain distance at a speed of 240 kmph in 5 hours. To cover the same distance in 123 hours, it must travel at a speed of:

A. 660

km/hr B. 680

km/hr

C. 700

km/hr D. 720

km/hr

[Hide Answer](#)

| Discuss

## Notebook

answer with explanation

Answer: Option D

Explanation:

Solution 1 old time : new time = 5:123

$$=5:53=1:13=3:1$$
$$\Rightarrow \text{old speed} : \text{new speed} = 1:3$$

Therefore, new speed =  $240 \times 3 = 720$  km/hr

**Solution 2** Distance = Speed  $\times$  Time =  $240 \times 5$  km

New time =123 hr=53 hr

Hence, new speed

$$=240 \times 553 = 240 \times 3 = 720 \text{ km/hr}$$

### **Problems on Time and Distance - Solved Examples (Set 4)**

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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option C

Explanation:

Solution 1 speed of car : speed of train :  $100:150=2:3$

$\Rightarrow$  time needed for car : time needed for train  $=3:2$

$\Rightarrow$  i.e., the train only takes  $\frac{2}{3}$  of the time taken by car.

Since both the car and train start and reach at the same time,  
13 of the time needed by car is 12.5 minutes.

$\Rightarrow$  Time needed by the car  $=3 \times 12.5$  min

Therefore, speed of the car  $=75(3 \times 12.560)=120$  km/hr

---

Solution 2 Let speed of the car  $=x$  kmph

Then, speed of the train

$=\frac{150}{100}x=1.5x$  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

$=\frac{75}{1.5x}+12.560$  hours

Since both start from A at the same time and reach point B at the same time,  
 $\frac{75}{x}=\frac{75}{1.5x}+12.560$   
 $25x=12.560$   
 $x=25 \times 60 \div 12.5=120$

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. 112

hour

C. 12

hour D. 1

hour

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Solution 1 Distance = 600

km

Let the duration of the flight =  $x$  hours.

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{600}{x} \dots (1)$$

Duration of the flight due to the slow down

$$= \frac{600}{x+12} \text{ hours}$$

$$\text{new speed} = \frac{600}{x+12} \dots (2)$$

From (1) and (2),

$$\text{Reduction in Speed} = \frac{600}{x} - \frac{600}{x+12}$$

Given that reduction in average speed = 200 km/hr.

$$\begin{aligned} \Rightarrow \frac{600}{x} - \frac{600}{x+12} &= 200 \Rightarrow \frac{600(x+12) - 600x}{x(x+12)} = 200 \\ \Rightarrow \frac{600x + 7200 - 600x}{x(x+12)} &= 200 \Rightarrow \frac{7200}{x(x+12)} = 200 \\ \Rightarrow 7200 &= 200x(x+12) \Rightarrow 36 = x(x+12) \\ \Rightarrow 36 &= x^2 + 12x \Rightarrow x^2 + 12x - 36 = 0 \dots (3) \end{aligned}$$

From here, we can get the answer using trial and error method. From the choices, it can be seen that  $x=1$  satisfies (3). Hence answer is 1 hour. Or, we can solve the (3) to get the answer.  $x^2 + 12x - 36 = 0 \Rightarrow (x+18)(x-2) = 0 \Rightarrow x = -18$  (ignoring the -ve value) Hence answer is 1 hour

Solution 2 Let the duration of the flight =  $t$  hours.

$$\text{old time} : \text{new time} = t : \frac{t+30}{60} = t : t+12$$

$$\Rightarrow \text{old speed} : \text{new speed} = \frac{t+12}{t}$$

$$(t+12):t=600t:(600t-200)\Rightarrow(t+12)$$

$$(600t-200)=600\Rightarrow 600-200t+300t-100=600\Rightarrow -200t+300t=100\Rightarrow -2t+3t=1\Rightarrow -2t+3=t\Rightarrow 2t+t-3=0$$

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

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Solution 1 Assume that the person would have covered x

km if travelled at 10 km/hr

$$\Rightarrow \text{speed} = x/10 \dots (1)$$

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

$$\Rightarrow \text{speed} = (x+20)/14 \dots (2)$$

From (1) and (2)

$$x/10 = (x+20)/14 \Rightarrow 14x = 10x + 200 \Rightarrow 4x = 200 \Rightarrow x = 200/4 = 50$$

$$\text{Solution 2 Let distance} = x \text{ km } x/(x+20) = 10/14 = 5/7 \Rightarrow 7x = 5x + 100 \Rightarrow 2x = 100 \Rightarrow x = 50$$

Solution 3 He travels 20 km more due to an increase of speed of 4 km/hr. Hence, with 10 km/hr, he travels  $20 \times 10 = 50$

km.

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 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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option B

Explanation:

Solution 1 Speed of second train =  $4004 = 100$  km/hr

Speed of first train : Speed of second train = 7:8

Therefore, speed of first train =  $1008 \times 7 = 87.5$  km/hr

---

Solution 2 Let speed of the trains be  $7x$  and  $8x$  respectively.

Speed of second train =  $4004 = 100$  km/hr

$\Rightarrow 8x = 100 \Rightarrow x = 1008 = 12.5$

Speed of the first train

$= 7x = 7 \times 12.5 = 87.5$  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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option A

Explanation:

Let speed of the train =  $x$



kmph

speed of the car =y kmph

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

$$\Rightarrow 120x + (600 - 120)y = 8 \Rightarrow 120x + 480y = 8 \Rightarrow 15x + 60y = 1 \dots (1)$$

Time needed for travelling 600 km if 200 km by train and the rest by car

$$= 8 \text{ hr } 20 \text{ min} = 8 \frac{20}{60} = 8 \frac{1}{3} = 253 \text{ hr}$$

$$\Rightarrow 200x + (600 - 200)y = 253 \Rightarrow 200x + 400y = 253 \Rightarrow 8x + 16y = 13 \Rightarrow 24x + 48y = 1 \dots (2)$$

$$\text{Here } (1) = (2) = 1 \Rightarrow 15x + 60y = 24x + 48y \Rightarrow 12y = 9x \Rightarrow 4y = 3x \Rightarrow xy = 34 \Rightarrow x:y = 3:4$$

### **Problems on Time and Distance - Solved Examples (Set 5)**

21. Arun is travelling 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](#) | [Discuss](#)

|

[Notebook](#)

answer with explanation

Answer: Option C

Explanation:

Solution 1 Let the distance be x

km

Travelling at 10 kmph, Arun will reach point A at 2 pm.

Travelling at 15 kmph, Arun will reach point A 12 noon.

Therefore, time taken when travelling at 10 km - time taken when travelling at 15 km = 2 hours

$$\Rightarrow x/10 - x/15 = 2 \Rightarrow 3x - 2x = 2 \times 30 \Rightarrow x = 60$$

Time needed if travelled at 10 kmph =  $60/10 = 6$  hours

Therefore, to reach at 1 pm, his travelling time must be  $(6 - 1) = 5$  hours.

Hence, required speed =  $\frac{605}{5} = 12$  kmph

---

Solution 2 [reference: formula 4](#)

To reach point A at 1 pm, he must take average time of the given cases. Hence, required speed is the average speed of the given cases.

Required speed =  $\frac{2 \times 10 \times 15 + 10 \times 15}{2 + 1} = \frac{450}{25} = 12$  kmph

---

Solution 3 Let time needed if travelled at 10 kmph be  $t$  hours

$$t:(t-2) = 15:10 \Rightarrow t:(t-2) = 3:2 \Rightarrow t = 6$$

To reach point A at 1 pm, time needed  
=  $(t-1) = 5$  hours

Let required speed be  $y$  kmph  
 $6:5 = y:10 \Rightarrow 5y = 60 \Rightarrow y = 12$

22. A car travels at an average of 50 miles per hour for 212 hours and then travels at a speed of 70 miles per hour for 112 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](#)

| [Discuss](#)  
[Notebook](#)

answer with explanation

Answer: Option B

Explanation:

speed1 = 50

miles/hour

time1 = 212 = 52 hour

distance1 =  $50 \times 52 = 2600$  miles

speed<sub>2</sub>=70 miles/hour

time<sub>2</sub>=112=32 hour

distance<sub>2</sub>=70×32=105 miles

Total distance=distance<sub>1</sub>+distance<sub>2</sub>=125+105=230 miles

23. The speed of a bus increases by 2 kmph after every one hour. If the distance travelled 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](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option B

Explanation:

Distance travelled in 1st

hour =35 km

Speed of the bus increases by 2 kmph after every one hour. Hence,

distance travelled in 2nd hour =37 km

distance travelled in 3rd hour =39 km

and so on

Total distance travelled

$=[35+37+39+\dots(12 \text{ terms})]=12[2\times 35+(12-1)2]=6(70+22)=6\times 92=552$

For more details on how we calculated the sum, refer [arithmetic progression and sum of first n terms](#)

Hence, 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, 115 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

[Hide Answer](#)

| [Discuss](#)  
[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

speed of sound = 1100 ft/s  
time = 115 second

distance =  $1100 \times 115 = 220 \times 11 = 2420$  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

[Hide Answer](#)

| [Discuss](#)  
[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

speed =  $\frac{\text{distance}}{\text{time}} = \frac{200}{24} \text{ m/s} = \frac{200}{24} \times 185 \text{ km/hr} = 40 \times 34 \text{ km/hr} = 30 \text{ km/hr}$

### **Problems on Time and Distance - Solved Examples (Set 6)**

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

A. 2229

m/s B. 22

m/s

C. 2119

m/sec D. 21

m/s

[Hide Answer](#) | [Discuss](#)

|

[Notebook](#)

answer with explanation

Answer: Option A

Explanation:

speed =80

km/hr =80×518 m/s

=40×59=2009=2229 m/s

27. The distance between two cities A and B is 330

km. A train starts from A at 8 a.m. and travels 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.

[Hide Answer](#) | [Discuss](#)

|

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Solution 1 Assume that they meet x hours after 8 a.m.

Then, train 1, starting from A, travels x hours till the trains meet.

Distance travelled by train 1 in  $x$  hours  $= 60x$  km

Train 2, starting from B, travels  $(x-1)$  hours till the trains meet.

Distance travelled by train 2 in  $(x-1)$  hours  $= 75(x-1)$  km

Total distance travelled

$=$  Distance travelled by train 1 + Distance travelled by train 2

$$\Rightarrow 330 = 60x + 75(x-1) \Rightarrow 12x + 15(x-1) = 66 \Rightarrow 12x + 15x - 15 = 66 \Rightarrow 27x = 66 + 15 = 81 \Rightarrow 3x = 9 \Rightarrow x = 3$$

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

---

Solution 2 Train 1, starting from A, travels 60 km in first hour. Hence, at 9 a.m., both trains are  $330 - 60 = 270$  km apart and relative speed is  $60 + 75 = 135$  kmph.

Time needed now for the trains to meet

$$= \frac{270}{135} = 2 \text{ hour}$$

i.e., the trains meet 2 hours after 9 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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option A

Explanation:

speed  $= 5$

km/hr

time  $= 15$  minutes  $= \frac{1}{4}$  hour

Length of the bridge

$=$  Distance travelled by the man in 15 minutes

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

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option A

Explanation:

Time needed to travel 600

km  $= \frac{600}{100} = 6$  hour

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

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

It means, the 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 journey.

Hence, total stopping time in the 600 km journey

$= 7 \times 3 = 21$  minutes

Total time needed to reach the destination

$= 6$  hours + 21 minutes

$= 6$  hours 21

minutes

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Solution 1 [reference: formula 4](#)

Speed from A to B =40

km/hr

Speed from B to A =40+20=60 km/hr

Average Speed = $\frac{2 \times 40 \times 60}{40+60}$  =48 km/hr

---

Solution 2 Assume that distance between A and B =x km

Speed from A to B =40 km/hr

Time from A to B = $\frac{x}{40}$  hr

Speed from B to A =40+20=60 km/hr

Time from B to A = $\frac{x}{60}$  hr

Total distance traveled =x+x=2x km

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

Average Speed =  $\frac{\text{Total distance travelled}}{\text{Total time taken}}$

taken =  $\frac{2x \times 40 \times 60}{x40 + x60} = \frac{2 \times 2400}{40+60} = 48$  km/hr

### **Problems on Time and Distance - Solved Examples (Set 7)**

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



[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

The man can count 21 telephone posts in one minute. Number of gaps between 21 posts is 20 and adjacent posts are 50 metres apart.

It means  $20 \times 50 = 1000$  metres are covered in 1 minute.

distance = 1000 m = 1 km

time = 1 min = 160 hr

speed =  $1(160) = 60$  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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option D

Explanation:

Speed of the truck = 550 metres/min

Speed of the train =  $33 \text{ km} / 45 \text{ min} = 33000 / 45 \text{ metres/min}$

Speed of the truck : Speed of the train

$= 550 : 33000 / 45 = 55 : 3300 / 45 = 5 : 300 / 45 = 1 : 60 / 45 = 1 : 43 = 3 : 4$

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

[Hide Answer](#)

| [Discuss](#)

[Notebook](#)

answer with explanation

Answer: Option B

Explanation:

Solution 1The 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

Now he needs to cover the remaining 3 km in remaining 15 minutes

Distance =3 km

Time =15 minutes =14 hour

Required Speed = $3(14)=12$  km/hr

---

Solution 2He needs to cover remaining half distance in remaining one-third of the total time.

i.e., 3 km in 15 minutes.

i.e., 12 km in 1 hour.

Therefore, required speed =12 km/hr