

Problems on Trains

1. A train is moving at a speed of 180 km/h. Its speed in meters per second (m/s) is:

- A) 40 m/s
- B) 45 m/s
- C) 50 m/s
- D) 60 m/s

Answer: C) 50 m/s

Explanation:

To convert speed from kilometers per hour (km/h) to meters per second (m/s), we use the conversion factor $5/18$.

Speed in m/s = Speed in km/h $\times 5/18$

Speed = $180 \times 5/18 = 10 \times 5 = 50$ m/s.

2. A train travels at 25 m/s. What is its speed in km/h?

- A) 72 km/h
- B) 80 km/h
- C) 90 km/h
- D) 100 km/h

Answer: C) 90 km/h

Explanation:

To convert speed from meters per second (m/s) to kilometers per hour (km/h), we use the conversion factor $18/5$.

Speed in km/h = Speed in m/s $\times 18/5$

Speed = $25 \times 18/5 = 5 \times 18 = 90$ km/h.

3. A train 150 m long is running at a speed of 36 km/h. How much time will it take to pass a telegraph pole?

A) 10 sec

B) 12 sec

C) 15 sec

D) 18 sec

Answer: C) 15 sec

Explanation:

When a train passes a stationary point object like a telegraph pole, the distance it covers is equal to its own length.

First, convert the speed to m/s:

Speed = 36 km/h = $36 \times \frac{5}{18} = 10$ m/s.

Distance = Length of the train = 150 m.

Time = Distance / Speed = $150 / 10 = 15$ seconds.

4. A train of length 200 m passes a man standing on a platform in 10 seconds. What is the speed of the train?

A) 20 m/s

B) 22 m/s

C) 24 m/s

D) 25 m/s

Answer: A) 20 m/s

Explanation:

The distance the train covers to pass the man is its own length.

Distance = 200 m.

Time = 10 s.

Speed = Distance / Time = $200 / 10 = 20$ m/s.

5. How long does a train 110 meters long running at a speed of 72 km/h take to cross a bridge 132 meters in length?

- A) 9.8 sec
- B) 12.1 sec
- C) 12.42 sec
- D) 14.3 sec

Answer: B) 12.1 sec

Explanation:

To cross a bridge, the train must cover its own length plus the length of the bridge.

Total distance = Length of train + Length of bridge = $110 + 132 = 242$ m.

Convert speed to m/s:

Speed = $72 \text{ km/h} = 72 \times \frac{5}{18} = 20 \text{ m/s}$.

Time = Total Distance / Speed = $242 / 20 = 12.1$ seconds.

6. A train running at a speed of 90 km/h crosses a platform 200 meters long in 22 seconds. What is the length of the train?

- A) 250 m
- B) 300 m
- C) 350 m
- D) 400 m

Answer: C) 350 m

Explanation:

First, convert the speed to m/s:

Speed = $90 \text{ km/h} = 90 \times \frac{5}{18} = 25 \text{ m/s}$.

The total distance covered by the train is its length plus the platform's length.

Total Distance = Speed x Time = $25 \times 22 = 550$ m.

Length of train = Total Distance - Length of platform = $550 - 200 = 350$ m.

7. A 300-meter long train crosses a platform in 39 seconds while it crosses a signal pole in 18 seconds. What is the length of the platform?

- A) 325 m
- B) 350 m
- C) 375 m
- D) 400 m

Answer: B) 350 m

Explanation:

First, calculate the speed of the train using the information about crossing the pole.

Speed = Length of train / Time to cross pole = $300 / 18$ m/s.

Now, calculate the total distance covered when crossing the platform.

Total Distance (Train + Platform) = Speed x Time to cross platform = $(300 / 18) \times 39 = 650$ m.

Length of platform = Total Distance - Length of train = $650 - 300 = 350$ m.

8. The length of a bridge, which a train 130 meters long and travelling at 45 km/h can cross in 30 seconds, is:

- A) 200 m
- B) 225 m
- C) 245 m
- D) 250 m

Answer: C) 245 m

Explanation:

Convert the speed to m/s:

Speed = 45 km/h = $45 \times 5/18 = 12.5$ m/s.

Calculate the total distance covered.

Total Distance = Speed x Time = $12.5 \times 30 = 375$ m.

Length of bridge = Total Distance - Length of train = $375 - 130 = 245$ m.

9. A train takes 10 seconds to pass a pole and 25 seconds to pass a platform of length 300 m. What is the length of the train?

A) 150 m

B) 200 m

C) 250 m

D) 300 m

Answer: B) 200 m

Explanation:

Let the length of the train be L meters and its speed be S m/s.

From the first condition (crossing a pole): $S = L / 10$

From the second condition (crossing a platform): $S = (L + 300) / 25$

Since the speed is the same, we can equate the two expressions:

$$L / 10 = (L + 300) / 25$$

$$25L = 10(L + 300)$$

$$25L = 10L + 3000$$

$$15L = 3000$$

$$L = 3000 / 15 = 200 \text{ m.}$$

10. A train moves past a telegraph post and a bridge 264 m long in 8 seconds and 20 seconds respectively. What is the speed of the train?

A) 69.5 km/h

B) 70 km/h

C) 79 km/h

D) 79.2 km/h

Answer: D) 79.2 km/h

Explanation:

Let the length of the train be L meters and its speed be S m/s.

$$S = L / 8 \Rightarrow L = 8S$$

$$S = (L + 264) / 20$$

Substitute the first equation into the second:

$$S = (8S + 264) / 20$$

$$20S = 8S + 264$$

$$12S = 264$$

$$S = 264 / 12 = 22 \text{ m/s.}$$

Convert speed to km/h: $22 \times 18/5 = 396 / 5 = 79.2 \text{ km/h.}$

11. A train passes a station platform in 36 seconds and a man standing on the platform in 20 seconds. If the speed of the train is 54 km/h, what is the length of the platform?

A) 220 m

B) 240 m

C) 260 m

D) 280 m

Answer: B) 240 m

Explanation:

Convert speed to m/s:

$$\text{Speed} = 54 \text{ km/h} = 54 \times 5/18 = 15 \text{ m/s.}$$

$$\text{Length of the train} = \text{Speed} \times \text{Time to cross the man} = 15 \times 20 = 300 \text{ m.}$$

$$\text{Total distance (Train + Platform)} = \text{Speed} \times \text{Time to cross platform} = 15 \times 36 = 540 \text{ m.}$$

$$\text{Length of the platform} = \text{Total distance} - \text{Length of the train} = 540 - 300 = 240 \text{ m.}$$

12. A train speeds past a pole in 15 seconds and a platform 100 m long in 25 seconds. What is its length?

A) 120 m

B) 150 m

C) 180 m

D) 200 m

Answer: B) 150 m

Explanation:

Let the length be L and speed be S.

$$S = L / 15$$

$$S = (L + 100) / 25$$

Equating the speeds:

$$L / 15 = (L + 100) / 25$$

$$25L = 15(L + 100)$$

$$25L = 15L + 1500$$

$$10L = 1500 \Rightarrow L = 150 \text{ m.}$$

13. A train of length 150 metres takes 40.5 seconds to cross a tunnel of length 300 metres. What is the speed of the train in km/h?

A) 13.33 km/h

B) 26.67 km/h

C) 40 km/h

D) 66.67 km/h

Answer: C) 40 km/h

Explanation:

Total Distance = Length of train + Length of tunnel = 150 + 300 = 450 m.

Time = 40.5 s.

Speed = Distance / Time = 450 / 40.5 = 4500 / 405 = 100 / 9 m/s.

Convert speed to km/h:

Speed = (100 / 9) x (18 / 5) = 20 x 2 = 40 km/h.

14. A train takes 18 seconds to pass completely through a station 162 m long and 15 seconds through another station 120 m long. The length of the train is:

A) 70 m

B) 80 m

C) 90 m

D) 100 m

Answer: C) 90 m

Explanation:

Let the length of the train be L meters and its speed be S m/s.

$$S = (L + 162) / 18$$

$$S = (L + 120) / 15$$

Equating the speeds:

$$(L + 162) / 18 = (L + 120) / 15$$

$$15(L + 162) = 18(L + 120)$$

$$15L + 2430 = 18L + 2160$$

$$3L = 2430 - 2160 = 270$$

$$L = 90 \text{ m.}$$

15. A train is 125 m long. If the train takes 30 seconds to cross a tree by the railway line, then the speed of the train is:

A) 14 km/h

B) 15 km/h

C) 16 km/h

D) 12 km/h

Answer: B) 15 km/h

Explanation:

Distance = Length of the train = 125 m.

Time = 30 s.

Speed = $125 / 30$ m/s.

Convert speed to km/h:

$$\text{Speed} = (125 / 30) \times (18 / 5) = (25 / 6) \times (18 / 5) = 5 \times 3 = 15 \text{ km/h.}$$

16. A train 360 m long is running at a speed of 45 km/h. In what time will it pass a bridge 140 m long?

A) 30 sec

B) 35 sec

C) 40 sec

D) 45 sec

Answer: C) 40 sec

Explanation:

Total Distance = $360 + 140 = 500$ m.

Speed = $45 \text{ km/h} = 45 \times \frac{5}{18} = 12.5 \text{ m/s}$.

Time = $500 / 12.5 = 5000 / 125 = 40$ seconds.

17. A 240-meter long train passes a 300-meter long platform in 27 seconds. What is the speed of the train in km/h?

A) 64 km/h

B) 68 km/h

C) 72 km/h

D) 76 km/h

Answer: C) 72 km/h

Explanation:

Total Distance = $240 + 300 = 540$ m.

Time = 27 s.

Speed = $540 / 27 = 20 \text{ m/s}$.

Convert speed to km/h:

Speed = $20 \times \frac{18}{5} = 4 \times 18 = 72 \text{ km/h}$.

18. A train running at a uniform speed passes a bridge 275 m long in 15 seconds and another bridge 425 m long in 21 seconds. The speed of the train is:

A) 20 m/s

B) 22 m/s

C) 25 m/s

D) 30 m/s

Answer: C) 25 m/s

Explanation:

The train travels an extra distance of $425 - 275 = 150$ m in $21 - 15 = 6$ seconds.

Speed = Difference in distance / Difference in time = $150 / 6 = 25$ m/s.

19. A train 800 metres long is running at a speed of 78 km/h. If it crosses a tunnel in 1 minute, then the length of the tunnel is:

A) 500 m

B) 520 m

C) 540 m

D) 560 m

Answer: A) 500 m

Explanation:

Speed = 78 km/h = $78 \times \frac{5}{18} = \frac{65}{3}$ m/s.

Time = 1 minute = 60 s.

Total Distance = Speed x Time = $(\frac{65}{3}) \times 60 = 65 \times 20 = 1300$ m.

Length of tunnel = Total Distance - Length of train = $1300 - 800 = 500$ m.

20. A train 280-meter long crosses a platform thrice its length in 56 seconds. What is the speed of the train in km/h?

A) 64 km/h

B) 72 km/h

C) 80 km/h

D) 90 km/h

Answer: B) 72 km/h

Explanation:

Length of platform = $3 \times 280 = 840$ m.

Total Distance = $280 + 840 = 1120$ m.

Time = 56 s.

Speed = $1120 / 56 = 20$ m/s.

Convert speed to km/h:

Speed = $20 \times 18/5 = 72$ km/h.

21. Two trains of length 120 m and 80 m are running in opposite directions with velocities of 42 km/h and 30 km/h. In what time will they cross each other?

A) 8 sec

B) 10 sec

C) 12 sec

D) 15 sec

Answer: B) 10 sec

Explanation:

When moving in opposite directions, the relative speed is the sum of their speeds.

Relative Speed = $42 + 30 = 72$ km/h.

Convert relative speed to m/s: $72 \times 5/18 = 20$ m/s.

Total distance to be covered = Sum of their lengths = $120 + 80 = 200$ m.

Time = Total Distance / Relative Speed = $200 / 20 = 10$ seconds.

22. Two trains are moving in opposite directions at 60 km/h and 90 km/h. Their lengths are 1.10 km and 0.9 km respectively. The time taken by the slower train to cross the faster train is:

A) 36 sec

B) 45 sec

C) 48 sec

D) 52 sec

Answer: C) 48 sec

Explanation:

Relative Speed = $60 + 90 = 150 \text{ km/h}$.

Convert speed to m/s: $150 \times \frac{5}{18} = \frac{125}{3} \text{ m/s}$.

Total distance = Sum of lengths = $1.10 \text{ km} + 0.9 \text{ km} = 2 \text{ km} = 2000 \text{ m}$.

Time = $2000 / (\frac{125}{3}) = (2000 \times 3) / 125 = 16 \times 3 = 48 \text{ seconds}$.

23. A train 150 m long is running with a speed of 52 km/h. In what time will it pass a man who is running at 8 km/h in the opposite direction?

A) 6 sec

B) 8 sec

C) 9 sec

D) 10 sec

Answer: C) 9 sec

Explanation:

Relative Speed = $52 + 8 = 60 \text{ km/h}$.

Convert speed to m/s: $60 \times \frac{5}{18} = \frac{50}{3} \text{ m/s}$.

Distance = Length of the train = 150 m.

Time = $150 / (\frac{50}{3}) = (150 \times 3) / 50 = 3 \times 3 = 9 \text{ seconds}$.

24. Two trains, 130 m and 110 m long, are going in the opposite direction. The first train runs at a speed of 62 km/h and the second train at 46 km/h. How long will they take to cross each other?

A) 6 sec

B) 8 sec

C) 10 sec

D) 12 sec

Answer: B) 8 sec

Explanation:

Relative Speed = $62 + 46 = 108 \text{ km/h}$.

Convert speed to m/s: $108 \times \frac{5}{18} = 30 \text{ m/s}$.

Total distance = $130 + 110 = 240 \text{ m}$.

Time = $240 / 30 = 8 \text{ seconds}$.

25. A train 100 m long travels at 50 km/h. How long does it take to cross another train 150 m long, running in the opposite direction at 40 km/h?

A) 8 sec

B) 9 sec

C) 10 sec

D) 11 sec

Answer: C) 10 sec

Explanation:

Relative Speed = $50 + 40 = 90 \text{ km/h}$.

Convert speed to m/s: $90 \times \frac{5}{18} = 25 \text{ m/s}$.

Total distance = $100 + 150 = 250 \text{ m}$.

Time = $250 / 25 = 10 \text{ seconds}$.

26. A 270 meters long train running at the speed of 120 kmph crosses another train running in the opposite direction at a speed of 80 kmph in 9 seconds. What is the length of the other train?

A) 230 m

B) 240 m

C) 260 m

D) 320 m

Answer: A) 230 m

Explanation:

Relative Speed = $120 + 80 = 200 \text{ kmph}$.

Convert speed to m/s: $200 \times \frac{5}{18} = \frac{500}{9} \text{ m/s}$.

Total Distance = Relative Speed x Time = $(\frac{500}{9}) \times 9 = 500 \text{ m}$.

Length of other train = Total Distance - Length of first train = $500 - 270 = 230$ m.

27. Two trains are running in opposite directions with the same speed. If the length of each train is 120 meters and they cross each other in 12 seconds, then the speed of each train (in km/h) is:

A) 36

B) 42

C) 54

D) 72

Answer: A) 36

Explanation:

Let the speed of each train be S km/h.

Relative Speed = $S + S = 2S$ km/h.

Total distance = $120 + 120 = 240$ m.

Time = 12 s.

Relative Speed in m/s = $240 / 12 = 20$ m/s.

Now, $2S$ km/h = 20 m/s.

$2S \times 5/18 = 20$

$2S = 20 \times 18/5 = 72$

$S = 36$ km/h.

28. A train 110 metres long is running with a speed of 60 kmph. In what time will it pass a man who is running at 6 kmph in the direction opposite to that of the train?

A) 5 sec

B) 6 sec

C) 7 sec

D) 10 sec

Answer: B) 6 sec

Explanation:

Relative Speed = $60 + 6 = 66$ kmph.

Convert speed to m/s: $66 \times \frac{5}{18} = \frac{55}{3}$ m/s.

Distance = 110 m.

Time = $110 / (\frac{55}{3}) = (110 \times 3) / 55 = 2 \times 3 = 6$ seconds.

29. A train 108 m long moving at a speed of 50 km/h crosses a train 112 m long coming from the opposite direction in 6 seconds. The speed of the second train is:

A) 48 km/h

B) 54 km/h

C) 66 km/h

D) 82 km/h

Answer: D) 82 km/h

Explanation:

Total distance = $108 + 112 = 220$ m.

Time = 6 s.

Relative Speed (in m/s) = $220 / 6 = \frac{110}{3}$ m/s.

Convert relative speed to km/h: $(\frac{110}{3}) \times (\frac{18}{5}) = 22 \times 6 = 132$ km/h.

Let the speed of the second train be S.

Relative Speed = $50 + S = 132$.

$S = 132 - 50 = 82$ km/h.

30. A train 220 m long is running with a speed of 59 km/h. In what time will it pass a man who is running at 7 km/h in the direction opposite to that of the train?

A) 10 sec

B) 11 sec

C) 12 sec

D) 13 sec

Answer: C) 12 sec

Explanation:

Relative Speed = $59 + 7 = 66$ km/h.

Convert speed to m/s: $66 \times \frac{5}{18} = \frac{55}{3}$ m/s.

Distance = 220 m.

Time = $220 / (\frac{55}{3}) = (220 \times 3) / 55 = 4 \times 3 = 12$ seconds.

31. Two trains, 140 m and 160 m long, run at speeds of 60 km/h and 40 km/h respectively in opposite directions on parallel tracks. The time which they take to cross each other is:

A) 9 sec

B) 10 sec

C) 10.8 sec

D) 11.2 sec

Answer: C) 10.8 sec

Explanation:

Relative Speed = $60 + 40 = 100$ km/h.

Convert speed to m/s: $100 \times \frac{5}{18} = \frac{250}{9}$ m/s.

Total distance = $140 + 160 = 300$ m.

Time = $300 / (\frac{250}{9}) = (300 \times 9) / 250 = (6 \times 9) / 5 = 54 / 5 = 10.8$ seconds.

32. Two trains are traveling in opposite directions at 72 km/h and 108 km/h. Their lengths are 210 m and 190 m. How long will they take to cross each other?

A) 8 sec

B) 9 sec

C) 10 sec

D) 11 sec

Answer: A) 8 sec

Explanation:

Relative Speed = $72 + 108 = 180$ km/h.

Convert speed to m/s: $180 \times \frac{5}{18} = 50$ m/s.

Total distance = $210 + 190 = 400$ m.

Time = $400 / 50 = 8$ seconds.

33. A 210 m long train takes 6 s to cross a man running at 9 kmph in a direction opposite to that of the train. What is the speed of the train?

A) 117 kmph

B) 126 kmph

C) 135 kmph

D) 144 kmph

Answer: A) 117 kmph

Explanation:

Let the speed of the train be S kmph.

Relative Speed = $S + 9$ kmph.

Distance = 210 m. Time = 6 s.

Relative speed in m/s = $210 / 6 = 35$ m/s.

Convert this to km/h: $35 \times \frac{18}{5} = 7 \times 18 = 126$ km/h.

So, $S + 9 = 126$.

$S = 126 - 9 = 117$ kmph.

34. A train of length 200m takes 12 seconds to cross a man walking at 10 km/hr in the opposite direction. What is the speed of the train?

A) 50 km/hr

B) 55 km/hr

C) 60 km/hr

D) 65 km/hr

Answer: A) 50 km/hr

Explanation:

Let the speed of the train be S km/hr.

Relative Speed = $S + 10$ km/hr.

Distance = 200 m. Time = 12 s.

Relative speed in m/s = $200 / 12 = 50/3$ m/s.

Convert this to km/h: $(50/3) \times (18/5) = 10 \times 6 = 60$ km/h.

$S + 10 = 60$.

$S = 50$ km/hr.

35. A train 250 m in length is running at a speed of 10 m/s. It will cross a man coming from the opposite direction at a speed of 5 m/s in:

A) 12.66 sec

B) 14.33 sec

C) 16.66 sec

D) 18.33 sec

Answer: C) 16.66 sec

Explanation:

Relative Speed = $10 + 5 = 15$ m/s.

Distance = 250 m.

Time = $250 / 15 = 50 / 3 = 16.66$ seconds.

36. A train 100 m long is running at a speed of 70 km/h. A man is running at 10 km/h in the same direction. In how much time will the train pass the man?

A) 5 sec

B) 6 sec

C) 8 sec

D) 10 sec

Answer: B) 6 sec

Explanation:

When moving in the same direction, the relative speed is the difference between their speeds.

Relative Speed = $70 - 10 = 60$ km/h.

Convert speed to m/s: $60 \times \frac{5}{18} = 50/3$ m/s.

Distance = Length of the train = 100 m.

Time = $100 / (50/3) = (100 \times 3) / 50 = 2 \times 3 = 6$ seconds.

37. A train 200 m long, running at 36 km/h, is overtaken by another train 250 m long running at 45 km/h in the same direction. In how much time will the faster train cross the slower one completely?

A) 150 sec

B) 160 sec

C) 180 sec

D) 200 sec

Answer: C) 180 sec

Explanation:

Relative Speed = $45 - 36 = 9$ km/h.

Convert speed to m/s: $9 \times \frac{5}{18} = 2.5$ m/s.

Total distance = Sum of their lengths = $200 + 250 = 450$ m.

Time = $450 / 2.5 = 4500 / 25 = 180$ seconds.

38. Two trains of lengths 160 m and 140 m are running in the same direction on parallel tracks. The speed of the longer train is 77 km/h and the speed of the shorter train is 67 km/h. How long will it take for the faster train to cross the slower one?

A) 72 sec

B) 98 sec

C) 108 sec

D) 112 sec

Answer: C) 108 sec

Explanation:

The faster train is the longer one (160 m at 77 km/h).

Relative Speed = $77 - 67 = 10$ km/h.

Convert speed to m/s: $10 \times \frac{5}{18} = \frac{25}{9}$ m/s.

Total distance = $160 + 140 = 300$ m.

Time = $300 / (\frac{25}{9}) = (300 \times 9) / 25 = 12 \times 9 = 108$ seconds.

39. A train overtakes two persons who are walking in the same direction at the rate of 2 kmph and 4 kmph and passes them completely in 9 and 10 seconds respectively. The length of the train is:

A) 45 m

B) 50 m

C) 55 m

D) 60 m

Answer: B) 50 m

Explanation:

Let the length of the train be L m and its speed be S kmph.

Relative speed with first person = $S - 2$ kmph.

Relative speed with second person = $S - 4$ kmph.

Length of train = Relative Speed \times Time.

$$L = (S-2) \times \frac{5}{18} \times 9 = (S-2) \times \frac{5}{2}$$

$$L = (S-4) \times \frac{5}{18} \times 10 = (S-4) \times \frac{25}{9}$$

Equating the two expressions for L :

$$(S-2) \times \frac{5}{2} = (S-4) \times \frac{25}{9}$$

$$(S-2) / 2 = (S-4) / 9 \times 5$$

$$9(S-2) = 10(S-4)$$

$$9S - 18 = 10S - 40$$

$$S = 22 \text{ kmph.}$$

$$\text{Now find } L: L = (22-2) \times \frac{5}{2} = 20 \times \frac{5}{2} = 50 \text{ m.}$$

40. A 200m long train is running at 68 km/h. It overtakes a man running in the same direction at 8 km/h. How long will it take to pass the man?

A) 10 sec

B) 12 sec

C) 15 sec

D) 18 sec

Answer: B) 12 sec

Explanation:

Relative Speed = $68 - 8 = 60$ km/h.

Convert speed to m/s: $60 \times \frac{5}{18} = \frac{50}{3}$ m/s.

Distance = 200 m.

Time = $200 / (\frac{50}{3}) = (200 \times 3) / 50 = 4 \times 3 = 12$ seconds.

41. Two trains of equal length take 10 seconds and 15 seconds respectively to cross a telegraph post. If the length of each train is 120 metres, in what time will they cross each other travelling in the same direction?

A) 60 sec

B) 65 sec

C) 70 sec

D) 72 sec

Answer: A) 60 sec

Explanation:

Speed of first train (S_1) = $120 / 10 = 12$ m/s.

Speed of second train (S_2) = $120 / 15 = 8$ m/s.

They are moving in the same direction, so the faster train crosses the slower one.

Relative Speed = $S_1 - S_2 = 12 - 8 = 4$ m/s.

Total distance = $120 + 120 = 240$ m.

Time = $240 / 4 = 60$ seconds.

42. A train passes two men walking in the same direction at 3 km/hr and 5 km/hr in 10 seconds and 11 seconds respectively. The speed of the train is:

A) 25 km/hr

B) 27 km/hr

C) 28 km/hr

D) 30 km/hr

Answer: A) 25 km/hr

Explanation:

Let the length be L m and speed be S km/hr.

$$L = (S-3) \times \frac{5}{18} \times 10 = (S-3) \times \frac{50}{18}$$

$$L = (S-5) \times \frac{5}{18} \times 11 = (S-5) \times \frac{55}{18}$$

$$(S-3) \times 50 = (S-5) \times 55$$

$$10(S-3) = 11(S-5)$$

$$10S - 30 = 11S - 55$$

$$S = 25 \text{ km/hr.}$$

43. A train running at 54 km/h crosses a passenger sitting in another train travelling in the same direction at a speed of 18 km/h in 30 seconds. Find the length of the faster train.

A) 250 m

B) 300 m

C) 350 m

D) 400 m

Answer: B) 300 m

Explanation:

Here, the distance to be covered is the length of the faster train only, as it's crossing a point object (the passenger).

$$\text{Relative Speed} = 54 - 18 = 36 \text{ km/h.}$$

$$\text{Convert speed to m/s: } 36 \times \frac{5}{18} = 10 \text{ m/s.}$$

$$\text{Length of faster train} = \text{Relative Speed} \times \text{Time} = 10 \times 30 = 300 \text{ m.}$$

44. How many seconds will a 500-meter long train take to cross a man walking with a speed of 3 km/h in the direction of the moving train if the speed of the train is 63 km/h?

- A) 25 sec
- B) 30 sec
- C) 40 sec
- D) 45 sec

Answer: B) 30 sec

Explanation:

Relative Speed = $63 - 3 = 60$ km/h.

Convert speed to m/s: $60 \times \frac{5}{18} = \frac{50}{3}$ m/s.

Distance = 500 m.

Time = $500 / (\frac{50}{3}) = (500 \times 3) / 50 = 10 \times 3 = 30$ seconds.

45. Two trains are running at 40 km/h and 20 km/h respectively in the same direction. The fast train completely passes a man sitting in the slow train in 5 seconds. The length of the fast train is:

- A) 23 m
- B) 23.9 m
- C) 27 m
- D) 27.78 m

Answer: D) 27.78 m

Explanation:

Relative Speed = $40 - 20 = 20$ km/h.

Convert speed to m/s: $20 \times \frac{5}{18} = \frac{50}{9}$ m/s.

Length of fast train = Relative Speed x Time = $(\frac{50}{9}) \times 5 = \frac{250}{9} = 27.78$ m.

46. A 150m long train running at 78 km/hr crosses another 120m long train running in the same direction in 54 seconds. What is the speed of the slower train?

A) 50 km/h

B) 60 km/h

C) 70 km/h

D) 48 km/h

Answer: B) 60 km/h

Explanation:

Let speed of slower train be S km/hr.

Relative Speed = $78 - S$ km/hr.

Total distance = $150 + 120 = 270$ m. Time = 54 s.

Relative speed in m/s = $270 / 54 = 5$ m/s.

Convert this to km/h: $5 \times 18/5 = 18$ km/h.

$78 - S = 18$.

$S = 78 - 18 = 60$ km/h.

47. A train whose length is 150 m, passes a person walking at a speed of 6 km/h in the same direction in 30 seconds. What is the speed of the train?

A) 18 km/h

B) 20 km/h

C) 24 km/h

D) 30 km/h

Answer: C) 24 km/h

Explanation:

Let the train's speed be S km/h.

Relative Speed = $S - 6$ km/h.

Distance = 150 m. Time = 30 s.

Relative speed in m/s = $150 / 30 = 5$ m/s.

Convert this to km/h: $5 \times 18/5 = 18$ km/h.

$S - 6 = 18$.

$$S = 24 \text{ km/h.}$$

48. A train 120 m long is travelling at a speed of 90 km/h. It will cross a cyclist moving at 18 km/h in the same direction in:

A) 6 sec

B) 8 sec

C) 10 sec

D) 12 sec

Answer: A) 6 sec

Explanation:

$$\text{Relative Speed} = 90 - 18 = 72 \text{ km/h.}$$

$$\text{Convert speed to m/s: } 72 \times \frac{5}{18} = 20 \text{ m/s.}$$

$$\text{Distance} = 120 \text{ m.}$$

$$\text{Time} = 120 / 20 = 6 \text{ seconds.}$$

49. A train overtakes two persons walking along a railway track. The first walks at 4.5 km/h and the other at 5.4 km/h. The train needs 8.4 and 8.5 seconds respectively to overtake them. What is the speed of the train if both persons walk in the same direction as the train?

A) 66 km/h

B) 72 km/h

C) 78 km/h

D) 81 km/h

Answer: D) 81 km/h

Explanation:

Let the length be L m and speed be S km/h.

$$L = (S - 4.5) \times \frac{5}{18} \times 8.4$$

$$L = (S - 5.4) \times \frac{5}{18} \times 8.5$$

$$(S - 4.5) \times 8.4 = (S - 5.4) \times 8.5$$

$$8.4S - 37.8 = 8.5S - 45.9$$

$$0.1S = 45.9 - 37.8 = 8.1$$

$$S = 81 \text{ km/h.}$$

50. A train takes 12 seconds to pass a man walking at 5 km/h in the same direction. If the speed of the train is 20 km/h, find the length of the train.

A) 100 m

B) 50 m

C) 66.67 m

D) 75 m

Answer: B) 50 m

Explanation:

Relative Speed = $20 - 5 = 15 \text{ km/h.}$

Convert speed to m/s: $15 \times 5/18 = 25/6 \text{ m/s.}$

Length of train (Distance) = Relative Speed \times Time = $(25/6) \times 12 = 25 \times 2 = 50 \text{ m.}$

51. A train starts from station A at 7 AM and reaches station B at 11 AM. Another train starts from B at 8 AM and reaches A at 11:30 AM. At what time do the two trains cross each other?

A) 9:24 AM

B) 9:26 AM

C) 9:36 AM

D) 9:45 AM

Answer: A) 9:24 AM

Explanation:

Time taken by first train (T_1) = 4 hours.

Time taken by second train (T_2) = 3.5 hours = $7/2$ hours.

Let the distance between A and B be $D \text{ km.}$

Speed of first train (S_1) = $D/4 \text{ km/h.}$

Speed of second train (S_2) = $D/(7/2) = 2D/7 \text{ km/h.}$

By 8 AM, the first train has already travelled for 1 hour, covering a distance of $D/4 \text{ km.}$

Remaining distance = $D - D/4 = 3D/4$ km.

Now, they travel towards each other. Relative speed = $S_1 + S_2 = D/4 + 2D/7 = (7D + 8D)/28 = 15D/28$ km/h.

Time to meet = Remaining Distance / Relative Speed = $(3D/4) / (15D/28) = (3D/4) \times (28/15D) = (3 \times 7)/15 = 7/5$ hours.

$7/5$ hours = 1.4 hours = 1 hour and $0.4 \times 60 = 24$ minutes.

They meet 1 hour and 24 minutes after 8 AM, which is 9:24 AM.

52. A goods train and a passenger train are running on parallel tracks in the same direction. The driver of the goods train observes that the passenger train coming from behind overtakes and crosses his train completely in 60 seconds. Whereas a passenger on the passenger train observes that he crosses the goods train in 40 seconds. If the speeds of the trains are in the ratio 1:2, find the ratio of their lengths.

A) 1:2

B) 2:1

C) 2:3

D) 3:2

Answer: B) 2:1

Explanation:

Let speeds be S and $2S$. Let lengths be L_g and L_p .

Relative speed = $2S - S = S$.

Case 1: Passenger train crosses goods train.

Total distance = $L_g + L_p$. Time = 60 s.

$L_g + L_p = S \times 60$.

Case 2: Passenger crosses the goods train.

Distance = L_g . Time = 40 s.

$L_g = S \times 40$.

Substitute L_g into the first equation:

$40S + L_p = 60S \Rightarrow L_p = 20S$.

Ratio of lengths $L_g / L_p = 40S / 20S = 2 / 1$. So, the ratio is 2:1.

53. Two stations A and B are 110 km apart. One train starts from A at 7 a.m. and travels towards B at 20 kmph. Another train starts from B at 8 a.m. and travels towards A at 25 kmph. At what time will they meet?

- A) 9 a.m.
- B) 10 a.m.
- C) 10:30 a.m.
- D) 11 a.m.

Answer: B) 10 a.m.

Explanation:

From 7 a.m. to 8 a.m., the first train travels for 1 hour.

Distance covered by first train = $20 \times 1 = 20$ km.

Remaining distance between them at 8 a.m. = $110 - 20 = 90$ km.

Now, both trains are moving towards each other.

Relative speed = $20 + 25 = 45$ kmph.

Time to meet = Remaining Distance / Relative Speed = $90 / 45 = 2$ hours.

They will meet 2 hours after 8 a.m., which is 10 a.m.

54. 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 at the same time. On the way, the train lost about 12.5 minutes while stopping. The speed of the car is:

- A) 100 kmph
- B) 110 kmph
- C) 120 kmph
- D) 130 kmph

Answer: C) 120 kmph

Explanation:

Let the speed of the car be S kmph.

Speed of the train = $1.5S$ kmph.

Time taken by car = $75 / S$ hours.

Time taken by train (without stops) = $75 / 1.5S$ hours.

The train stopped for 12.5 minutes = $12.5 / 60 = 125 / 600 = 5 / 24$ hours.

Total time for train = $(75 / 1.5S) + (5 / 24)$.

Since they reach at the same time:

$$75 / S = 75 / 1.5S + 5 / 24$$

$$75 / S - 50 / S = 5 / 24$$

$$25 / S = 5 / 24$$

$$S = (25 \times 24) / 5 = 5 \times 24 = 120 \text{ kmph.}$$

55. A train without stoppage travels at 50 km/hr and with stoppage, it travels at 40 km/hr. For how many minutes does the train stop on an average per hour?

A) 10 min

B) 12 min

C) 15 min

D) 18 min

Answer: B) 12 min

Explanation:

Due to stoppages, the train covers $50 - 40 = 10$ km less per hour.

Time taken to cover 10 km at the original speed = Distance / Speed = $10 / 50$ hours.

Stoppage time per hour = $1/5$ hours = $(1/5) \times 60 = 12$ minutes.

56. A train 150m long crosses a milestone in 15 seconds and another train of the same length travelling in the opposite direction in 12 seconds. The speed of the second train is:

A) 36 km/h

B) 45 km/h

C) 54 km/h

D) 60 km/h

Answer: C) 54 km/h

Explanation:

Speed of the first train (S_1) = $150 / 15 = 10$ m/s.

Total distance for crossing = $150 + 150 = 300$ m. Time = 12 s.

Relative speed (opposite direction) = $300 / 12 = 25$ m/s.

Let speed of second train be S_2 .

Relative Speed = $S_1 + S_2$.

$25 = 10 + S_2 \Rightarrow S_2 = 15$ m/s.

Convert S_2 to km/h: $15 \times 18/5 = 3 \times 18 = 54$ km/h.

57. Two trains, A and B, start from stations X and Y towards Y and X respectively. After passing each other, they take 4 hours 48 minutes and 3 hours 20 minutes to reach Y and X respectively. If train A is moving at 45 km/hr, then the speed of train B is:

A) 54 km/hr

B) 60 km/hr

C) 64.8 km/hr

D) 72 km/hr

Answer: A) 54 km/hr

Explanation:

This is a standard formula problem. If two trains start at the same time from points A and B towards each other and after crossing, they take 'a' and 'b' time to reach B and A respectively, then (A's speed) / (B's speed) = $\sqrt{b/a}$.

Time 'a' = 4 hr 48 min = $4 + 48/60 = 4 + 4/5 = 24/5$ hours.

Time 'b' = 3 hr 20 min = $3 + 20/60 = 3 + 1/3 = 10/3$ hours.

Speed of A = 45 km/hr. Let speed of B be S_B .

$45 / S_B = \sqrt{(10/3) / (24/5)} = \sqrt{(10/3) \times (5/24)} = \sqrt{50/72} = \sqrt{25/36} = 5/6$.

$45 \times 6 = 5 \times S_B$

$S_B = (45 \times 6) / 5 = 9 \times 6 = 54$ km/hr.

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

- A) 70 km/hr
- B) 75 km/hr
- C) 84 km/hr
- D) 87.5 km/hr

Answer: D) 87.5 km/hr

Explanation:

Speed of the second train = $400 / 4 = 100$ km/hr.

Let the speeds be $7x$ and $8x$.

$$8x = 100 \Rightarrow x = 100 / 8 = 12.5.$$

Speed of the first train = $7x = 7 \times 12.5 = 87.5$ km/hr.

59. A train running at $7/11$ of its own speed reached a place in 22 hours. How much time could be saved if the train had run at its own speed?

- A) 7 hours
- B) 8 hours
- C) 14 hours
- D) 16 hours

Answer: B) 8 hours

Explanation:

Since speed is proportional to $1/\text{time}$, if the new speed is $7/11$ of the usual speed, the new time will be $11/7$ of the usual time.

New time = $(11/7) \times$ Usual time.

$$22 = (11/7) \times \text{Usual time.}$$

$$\text{Usual time} = (22 \times 7) / 11 = 14 \text{ hours.}$$

$$\text{Time saved} = 22 - 14 = 8 \text{ hours.}$$

60. A train travelling at 48 km/hr completely crosses another train having half its length and travelling in the opposite direction at 42 km/hr, in 12 seconds. It also passes a railway platform in 45 seconds. The length of the platform is:

- A) 400 m
- B) 450 m
- C) 560 m
- D) 600 m

Answer: A) 400 m

Explanation:

Let the length of the first train be $2L$. Length of the second train is L .

Relative speed = $48 + 42 = 90$ km/hr = $90 \times \frac{5}{18} = 25$ m/s.

Total distance = $2L + L = 3L$. Time = 12 s.

$3L = 25 \times 12 = 300 \Rightarrow L = 100$ m.

Length of the first train = $2L = 200$ m.

Speed of first train = 48 km/hr = $48 \times \frac{5}{18} = \frac{40}{3}$ m/s.

This train passes a platform in 45 seconds. Let platform length be P .

$200 + P = (\frac{40}{3}) \times 45 = 40 \times 15 = 600$ m.

$P = 600 - 200 = 400$ m.

61. A train is moving at 132 km/h. If the length of the train is 110 meters, how long will it take to cross a railway platform 165 meters long?

- A) 7.5 sec
- B) 8 sec
- C) 8.5 sec
- D) 9 sec

Answer: A) 7.5 sec

Explanation:

Total Distance = $110 + 165 = 275$ m.

Speed = 132 km/h = $132 \times \frac{5}{18} = \frac{110}{3}$ m/s.

$$\text{Time} = 275 / (110/3) = (275 \times 3) / 110 = (2.5 \times 3) / 1 = 7.5 \text{ seconds.}$$

62. Two trains start at the same time from A and B and proceed towards each other at 80 km/h and 95 km/h respectively. When they meet, it is found that one train has travelled 180 km more than the other. Find the distance between A and B.

A) 2100 km

B) 2200 km

C) 2300 km

D) 2400 km

Answer: A) 2100 km

Explanation:

Let them meet after t hours.

Distance covered by first train = $80t$.

Distance covered by second train = $95t$.

Difference in distance = $95t - 80t = 15t$.

$15t = 180 \Rightarrow t = 12 \text{ hours.}$

Total distance between A and B = Sum of distances covered = $80t + 95t = 175t$.

Total distance = $175 \times 12 = 2100 \text{ km.}$

63. A jogger running at 9 km/h alongside a railway track is 240 meters ahead of the engine of a 120 meters long train running at 45 km/h in the same direction. In how much time will the train pass the jogger?

A) 36 sec

B) 48 sec

C) 60 sec

D) 72 sec

Answer: A) 36 sec

Explanation:

The total distance the train needs to cover relative to the jogger is the initial gap plus its own length.

Total relative distance = $240 + 120 = 360$ m.

Relative speed (same direction) = $45 - 9 = 36$ km/h.

Convert speed to m/s: $36 \times \frac{5}{18} = 10$ m/s.

Time = Total relative distance / Relative speed = $360 / 10 = 36$ seconds.

64. A train covers a distance in 50 minutes if it runs at a speed of 48 kmph on average. The speed at which the train must run to reduce the time of journey to 40 minutes will be:

A) 50 km/h

B) 55 km/h

C) 60 km/h

D) 70 km/h

Answer: C) 60 km/h

Explanation:

Time = 50 minutes = $50/60 = 5/6$ hours.

Distance = Speed x Time = $48 \times 5/6 = 8 \times 5 = 40$ km.

New time = 40 minutes = $40/60 = 2/3$ hours.

New speed = Distance / New Time = $40 / (2/3) = (40 \times 3) / 2 = 60$ km/h.

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

A) 55 km/h

B) 57 km/h

C) 60 km/h

D) 63 km/h

Answer: C) 60 km/h

Explanation:

21 telephone posts mean there are $21 - 1 = 20$ gaps between them.

Total distance covered = $20 \times 50 = 1000 \text{ m} = 1 \text{ km}$.

Time = 1 minute = $1/60$ hours.

Speed = Distance / Time = $1 / (1/60) = 60 \text{ km/h}$.

66. Two trains of equal length are running on parallel lines in the same direction at 46 km/h and 36 km/h. The faster train passes the slower train in 36 seconds. The length of each train is:

A) 50 m

B) 72 m

C) 80 m

D) 82 m

Answer: A) 50 m

Explanation:

Let the length of each train be L.

Total distance to cover = $L + L = 2L$.

Relative speed = $46 - 36 = 10 \text{ km/h}$.

Convert speed to m/s: $10 \times 5/18 = 25/9 \text{ m/s}$.

$2L = \text{Relative Speed} \times \text{Time} = (25/9) \times 36 = 25 \times 4 = 100 \text{ m}$.

$L = 100 / 2 = 50 \text{ m}$.

67. Two trains start from stations P and Q and travel towards each other at speeds of 50 km/h and 40 km/h respectively. By the time they meet, the first train has traveled 100 km more than the second. The distance between P and Q is:

A) 500 km

B) 630 km

C) 810 km

D) 900 km

Answer: D) 900 km

Explanation:

Let them meet after t hours.

Distance by first train = $50t$.

Distance by second train = $40t$.

Difference = $50t - 40t = 10t$.

$10t = 100 \Rightarrow t = 10$ hours.

Total distance = $50t + 40t = 90t = 90 \times 10 = 900$ km.

68. A train X starts from Meerut at 4 p.m. and reaches Ghaziabad at 5 p.m. while another train Y starts from Ghaziabad at 4 p.m. and reaches Meerut at 5:30 p.m. The two trains will cross each other at:

A) 4:36 p.m.

B) 4:42 p.m.

C) 4:48 p.m.

D) 4:50 p.m.

Answer: A) 4:36 p.m.

Explanation:

Time for X = 1 hour. Time for Y = 1.5 hours = $\frac{3}{2}$ hours.

Let distance be D .

Speed of X = $\frac{D}{1} = D$. Speed of Y = $\frac{D}{(3/2)} = \frac{2D}{3}$.

They start at the same time (4 p.m.) and move towards each other.

Relative speed = $D + \frac{2D}{3} = \frac{5D}{3}$.

Time to meet = Distance / Relative Speed = $D / (\frac{5D}{3}) = \frac{3}{5}$ hours.

$\frac{3}{5}$ hours = $(\frac{3}{5}) \times 60 = 36$ minutes.

They meet 36 minutes after 4 p.m., which is 4:36 p.m.

69. Two trains from Howrah to Patna and from Patna to Howrah start at the same time and after meeting, reach their destinations in 9 hours and 16 hours respectively. The ratio of their speeds is:

A) 2:3

B) 4:3

C) 6:7

D) 9:16

Answer: B) 4:3

Explanation:

Using the formula:

$(\text{Speed of first train}) / (\text{Speed of second train}) = \sqrt{(\text{Time taken by second after meeting} / \text{Time taken by first after meeting})}$

Ratio of speeds = $\sqrt{16 / 9} = 4 / 3$.

So, the ratio is 4:3.

70. A train of length 240 m passes a pole in 24 seconds. How long will it take to pass a platform 650 m long?

A) 65 sec

B) 89 sec

C) 100 sec

D) 120 sec

Answer: B) 89 sec

Explanation:

Speed of the train = $240 / 24 = 10$ m/s.

Total distance to pass the platform = $240 + 650 = 890$ m.

Time = Distance / Speed = $890 / 10 = 89$ seconds.

71. A passenger train takes two hours less for a journey of 300 km if its speed is increased by 5 km/h from its usual speed. The usual speed is:

A) 25 km/h

B) 30 km/h

C) 35 km/h

D) 40 km/h

Answer: A) 25 km/h

Explanation:

Let the usual speed be S km/h.

Usual time = $300/S$. New time = $300/(S+5)$.

$$300/S - 300/(S+5) = 2$$

$$300(S+5) - 300S = 2S(S+5)$$

$$300S + 1500 - 300S = 2S^2 + 10S$$

$$2S^2 + 10S - 1500 = 0$$

$$S^2 + 5S - 750 = 0$$

$$(S+30)(S-25) = 0.$$

Since speed cannot be negative, $S = 25$ km/h.

72. 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 metres) is:

A) 500

B) 600

C) 750

D) 900

Answer: C) 750

Explanation:

Let length of train = length of platform = L .

Total distance = $L + L = 2L$.

Speed = 90 km/h = $90 \times \frac{5}{18} = 25$ m/s.

Time = 1 minute = 60 s.

$2L = \text{Speed} \times \text{Time} = 25 \times 60 = 1500$ m.

$L = 1500 / 2 = 750$ m.

73. A train is scheduled to cover the distance between two stations 46 km apart in one hour. If it travels 25 km at a speed of 40 km/h, find the speed for the remaining journey to complete it in the scheduled time.

A) 36 km/h

B) 46 km/h

C) 56 km/h

D) 66 km/h

Answer: C) 56 km/h

Explanation:

Time taken for the first 25 km = $25 / 40 = 5/8$ hours.

Remaining distance = $46 - 25 = 21$ km.

Total time = 1 hour. Remaining time = $1 - 5/8 = 3/8$ hours.

Required speed = Remaining Distance / Remaining Time = $21 / (3/8) = (21 \times 8) / 3 = 7 \times 8 = 56$ km/h.

74. A train starts from Delhi at 6:00 AM and reaches Chandigarh at 10:00 AM. Another train starts from Chandigarh at 8:00 AM and reaches Delhi at 11:30 AM. At what time do they cross each other?

A) 8:56 AM

B) 9:00 AM

C) 9:04 AM

D) 9:10 AM

Answer: A) 8:56 AM

Explanation:

Time for first train = 4 hrs. Time for second train = 3.5 hrs = $7/2$ hrs.

Let distance be D.

Speed of first train (S_1) = $D/4$. Speed of second train (S_2) = $D/(7/2) = 2D/7$.

By 8:00 AM, first train has travelled for 2 hours, covering $2 \times D/4 = D/2$.

Remaining distance = $D - D/2 = D/2$.

Relative speed = $D/4 + 2D/7 = (7D+8D)/28 = 15D/28$.

Time to meet = $(D/2) / (15D/28) = (D/2) \times (28/15D) = 14/15$ hours.

$14/15$ hours = $(14/15) \times 60 = 56$ minutes.

They meet 56 minutes after 8:00 AM, which is 8:56 AM.

75. A train B speeding with 120 kmph crosses another train C, running in the same direction in 2 minutes. If the lengths of trains B and C are 100 m and 200 m respectively, what is the speed of train C?

A) 111 kmph

B) 114 kmph

C) 117 kmph

D) 123 kmph

Answer: A) 111 kmph

Explanation:

Let speed of train C be S kmph.

Relative speed = $120 - S$ kmph.

Total distance = $100 + 200 = 300$ m.

Time = 2 minutes = 120 s.

Relative speed in m/s = $300 / 120 = 2.5$ m/s.

Convert this to km/h: $2.5 \times 18/5 = 0.5 \times 18 = 9$ km/h.

$120 - S = 9 \Rightarrow S = 120 - 9 = 111$ kmph.

76. A 320 m long train crosses a platform in 35 seconds. If the speed of the train is 72 km/h, what is the length of the platform?

A) 380 m

B) 400 m

C) 420 m

D) 440 m

Answer: A) 380 m

Explanation:

Speed = 72 km/h = $72 \times 5/18 = 20$ m/s.

Total distance = Speed \times Time = $20 \times 35 = 700$ m.

Length of platform = Total distance - Length of train = $700 - 320 = 380$ m.

77. A train is 100 m long and is running at a speed of 30 km/h. Find the time it will take to pass a man standing at a crossing.

A) 10 sec

B) 12 sec

C) 14 sec

D) 16 sec

Answer: B) 12 sec

Explanation:

Speed = 30 km/h = $30 \times \frac{5}{18} = \frac{25}{3}$ m/s.

Distance = 100 m.

Time = $100 / (\frac{25}{3}) = (100 \times 3) / 25 = 4 \times 3 = 12$ seconds.

78. A train 250m long is running at 90 km/h. In what time will it pass a 200m long train running in the opposite direction at 54 km/h?

A) 10.2 sec

B) 10.7 sec

C) 11.25 sec

D) 11.75 sec

Answer: C) 11.25 sec

Explanation:

Relative Speed = $90 + 54 = 144$ km/h.

Convert to m/s: $144 \times \frac{5}{18} = 8 \times 5 = 40$ m/s.

Total distance = $250 + 200 = 450$ m.

Time = $450 / 40 = 45 / 4 = 11.25$ seconds.

79. A train takes 5 seconds to pass a pole. If the length of the train is 100 m, the time taken by it to cross a railway platform 160 m long is:

- A) 11 sec
- B) 13 sec
- C) 15 sec
- D) 17 sec

Answer: B) 13 sec

Explanation:

Speed of the train = $100 / 5 = 20$ m/s.

Total distance for platform = $100 + 160 = 260$ m.

Time = $260 / 20 = 13$ seconds.

80. Two trains have lengths of 320 m and 480 m. They are running in the same direction on parallel tracks. If the faster train passes the driver of the slower train in 32 seconds, what is their relative speed?

- A) 36 km/h
- B) 40 km/h
- C) 45 km/h
- D) 50 km/h

Answer: A) 36 km/h

Explanation:

When the faster train passes the driver (a point), the distance covered is the length of the faster train. Assuming the first train is faster:

Distance = 320 m. Time = 32 s.

Relative speed = $320 / 32 = 10$ m/s.

Convert to km/h: $10 \times 18/5 = 36$ km/h.

81. A train running at 25 km/h takes 18 seconds to pass a platform. Next, it takes 12 seconds to pass a man walking at 5 km/h in the same direction. The length of the platform is:

- A) 58.33 m
- B) 60.33 m
- C) 62.33 m
- D) 64.33 m

Answer: A) 58.33 m

Explanation:

First, find the length of the train from the man-crossing info.

Relative speed with man = $25 - 5 = 20$ km/h = $20 \times \frac{5}{18} = \frac{50}{9}$ m/s.

Length of train = $(\frac{50}{9}) \times 12 = \frac{200}{3}$ m.

Now, find the length of the platform.

Speed of train = 25 km/h = $25 \times \frac{5}{18} = \frac{125}{18}$ m/s.

Total distance (Train + Platform) = $(\frac{125}{18}) \times 18 = 125$ m.

Length of platform = $125 - \frac{200}{3} = \frac{(375 - 200)}{3} = \frac{175}{3} = 58.33$ m.

82. A train 200m long crosses a 300m long bridge in 25 seconds. How long will it take to cross a man standing on the platform?

- A) 8 sec
- B) 10 sec
- C) 12 sec
- D) 15 sec

Answer: B) 10 sec

Explanation:

Total distance = $200 + 300 = 500$ m. Time = 25 s.

Speed = $500 / 25 = 20$ m/s.

Time to cross a man = Length of train / Speed = $200 / 20 = 10$ seconds.

83. A train travelling at 72 km/h crosses a platform in 30 seconds and a man standing on the platform in 18 seconds. What is the length of the platform?

- A) 240 m
- B) 360 m
- C) 420 m
- D) 600 m

Answer: A) 240 m

Explanation:

Speed = 72 km/h = $72 \times \frac{5}{18} = 20$ m/s.

Length of train = Speed x Time to cross man = $20 \times 18 = 360$ m.

Total distance = Speed x Time to cross platform = $20 \times 30 = 600$ m.

Length of platform = $600 - 360 = 240$ m.

84. A train 120m long travels at 108 km/h. How long does it take to cross a platform 180m long?

- A) 8 sec
- B) 9 sec
- C) 10 sec
- D) 12 sec

Answer: C) 10 sec

Explanation:

Total distance = $120 + 180 = 300$ m.

Speed = 108 km/h = $108 \times \frac{5}{18} = 30$ m/s.

Time = $300 / 30 = 10$ seconds.

85. Two trains start from the same point and move along two parallel tracks in the same direction. One train runs at 70 km/h and the other at 50 km/h. What is the distance between them after 30 minutes?

- A) 10 km

B) 15 km

C) 20 km

D) 25 km

Answer: A) 10 km

Explanation:

Relative speed = $70 - 50 = 20$ km/h.

Time = 30 minutes = 0.5 hours.

Distance between them = Relative speed \times Time = $20 \times 0.5 = 10$ km.

86. A train traveling at 60 km/hr crosses a man in 6 seconds. What is the length of the train?

A) 80 m

B) 90 m

C) 100 m

D) 120 m

Answer: C) 100 m

Explanation:

Speed = 60 km/hr = $60 \times \frac{5}{18} = \frac{50}{3}$ m/s.

Length of train = Speed \times Time = $(\frac{50}{3}) \times 6 = 100$ m.

87. A train is 200m long. It is running at 54 km/hr. In how much time will it pass a bridge of 100m?

A) 15 sec

B) 20 sec

C) 25 sec

D) 30 sec

Answer: B) 20 sec

Explanation:

Total distance = $200 + 100 = 300$ m.

Speed = 54 km/hr = $54 \times \frac{5}{18} = 15$ m/s.

Time = $300 / 15 = 20$ seconds.

88. A train of length 260 m crosses a bridge of length 40 m in 10 seconds. Find the time taken by the train to cross a stationary man.

A) 8.67 sec

B) 9.33 sec

C) 10.67 sec

D) 11.33 sec

Answer: A) 8.67 sec

Explanation:

Total distance = $260 + 40 = 300$ m. Time = 10 s.

Speed = $300 / 10 = 30$ m/s.

Time to cross a man = Length of train / Speed = $260 / 30 = 26/3 = 8.67$ seconds.

89. Two trains of equal length are running on parallel lines in opposite directions at 46 km/hr and 36 km/hr. The faster train passes the slower train in 36 seconds. The length of each train is:

A) 200 m

B) 320 m

C) 410 m

D) 460 m

Answer: C) 410 m

Explanation:

Assuming it means they cross each other in 36 seconds:

Relative Speed = $46 + 36 = 82$ km/hr = $82 \times \frac{5}{18} = \frac{205}{9}$ m/s.

Total distance = $L + L = 2L$.

$2L = (\frac{205}{9}) \times 36 = 205 \times 4 = 820$ m.

$L = 410$ m.

90. A train X running at 74 km/hr crosses another train Y running at 52 km/hr in the opposite direction in 10 seconds. If the length of Y is two-thirds that of X, then what is the length of X?

A) 160 m

B) 210 m

C) 240 m

D) 260 m

Answer: B) 210 m

Explanation:

Relative Speed = $74 + 52 = 126 \text{ km/hr} = 126 \times \frac{5}{18} = 35 \text{ m/s}$.

Let length of X be L. Length of Y is $(\frac{2}{3})L$.

Total distance = $L + (\frac{2}{3})L = (\frac{5}{3})L$.

$(\frac{5}{3})L = \text{Speed} \times \text{Time} = 35 \times 10 = 350$.

$L = (350 \times 3) / 5 = 70 \times 3 = 210 \text{ m}$.

91. A train passes two bridges of lengths 800 m and 400 m in 100 seconds and 60 seconds respectively. The length of the train is:

A) 80 m

B) 90 m

C) 200 m

D) 150 m

Answer: C) 200 m

Explanation:

The train travels an extra distance of $800 - 400 = 400 \text{ m}$ in $100 - 60 = 40 \text{ seconds}$.

Speed = $400 / 40 = 10 \text{ m/s}$.

Let length of train be L. Using the second bridge info:

$L + 400 = \text{Speed} \times \text{Time} = 10 \times 60 = 600$.

$L = 600 - 400 = 200 \text{ m}$.

92. Two trains of lengths 100 m and 120 m are travelling in the same direction with speeds of 72 km/hr and 54 km/hr respectively. In how much time will the first train cross the second?

A) 40 sec

B) 44 sec

C) 48 sec

D) 50 sec

Answer: B) 44 sec

Explanation:

Relative speed = $72 - 54 = 18 \text{ km/hr} = 18 \times \frac{5}{18} = 5 \text{ m/s}$.

Total distance = $100 + 120 = 220 \text{ m}$.

Time = $220 / 5 = 44 \text{ seconds}$.

93. A 180 m long train crosses another 270 m long train running in the opposite direction in 10.8 seconds. If the speed of the first train is 60 km/h, what is the speed of the second train?

A) 80 km/h

B) 90 km/h

C) 100 km/h

D) 110 km/h

Answer: B) 90 km/h

Explanation:

Total distance = $180 + 270 = 450 \text{ m}$.

Time = 10.8 s.

Relative speed = $450 / 10.8 = 4500 / 108 = 125/3 \text{ m/s}$.

Convert to km/h: $(125/3) \times (18/5) = 25 \times 6 = 150 \text{ km/h}$.

Let speed of second train be S.

$60 + S = 150 \Rightarrow S = 90 \text{ km/h}$.

94. A train travelling at a certain speed crosses a platform 150m long in 15 seconds and a man standing on the platform in 9 seconds. The speed of the train is:

- A) 25 m/s
- B) 30 m/s
- C) 20 m/s
- D) 15 m/s

Answer: A) 25 m/s

Explanation:

Let length be L and speed be S.

$$L = S \times 9.$$

$$L + 150 = S \times 15.$$

Substitute the first equation into the second:

$$9S + 150 = 15S$$

$$6S = 150 \Rightarrow S = 25 \text{ m/s.}$$

95. A train traveling at 45 km/h crosses a man walking at 9 km/h in the same direction in 20 seconds. What is the length of the train?

- A) 150 m
- B) 180 m
- C) 200 m
- D) 220 m

Answer: C) 200 m

Explanation:

$$\text{Relative speed} = 45 - 9 = 36 \text{ km/h} = 36 \times \frac{5}{18} = 10 \text{ m/s.}$$

$$\text{Length of train} = \text{Speed} \times \text{Time} = 10 \times 20 = 200 \text{ m.}$$

96. A man sees a train passing over a 1 km long bridge. The length of the train is half that of the bridge. If the train clears the bridge in 2 minutes, the speed of the train is:

- A) 45 km/h
- B) 50 km/h
- C) 55 km/h
- D) 60 km/h

Answer: A) 45 km/h

Explanation:

Length of bridge = 1 km = 1000 m.

Length of train = $1000 / 2 = 500$ m.

Total distance = $1000 + 500 = 1500$ m = 1.5 km.

Time = 2 minutes = $2/60 = 1/30$ hours.

Speed = Distance / Time = $1.5 / (1/30) = 1.5 \times 30 = 45$ km/h.

97. A train takes 9 seconds to cross a pole. If the speed of the train is 48 kmph, then the length of the train is:

- A) 150 m
- B) 120 m
- C) 90 m
- D) 80 m

Answer: B) 120 m

Explanation:

Speed = 48 kmph = $48 \times 5/18 = 40/3$ m/s.

Length = Speed x Time = $(40/3) \times 9 = 40 \times 3 = 120$ m.

98. The ratio of the length of two trains is 5:3 and the ratio of their speeds is 6:5. The ratio of time taken by them to cross a pole is:

- A) 5:6

B) 11:8

C) 25:18

D) 27:16

Answer: C) 25:18

Explanation:

Let lengths be $5L$ and $3L$. Let speeds be $6S$ and $5S$.

Time = Length / Speed.

Time for first train (T_1) = $5L / 6S$.

Time for second train (T_2) = $3L / 5S$.

Ratio of time $T_1:T_2 = (5L/6S) / (3L/5S) = (5/6) \times (5/3) = 25/18$.

The ratio is 25:18.

99. A train 150 m long passes a stone in 30 seconds and another train of the same length travelling in the opposite direction in 10 seconds. The speed of the second train is:

A) 90 km/h

B) 72 km/h

C) 60 km/h

D) 48 km/h

Answer: B) 72 km/h

Explanation:

Speed of first train (S_1) = $150 / 30 = 5$ m/s.

Total distance for crossing = $150 + 150 = 300$ m. Time = 10 s.

Relative speed = $300 / 10 = 30$ m/s.

$S_1 + S_2 = 30 \Rightarrow 5 + S_2 = 30 \Rightarrow S_2 = 25$ m/s.

Convert S_2 to km/h: $25 \times 18/5 = 90$ km/h.

Note: There seems to be a discrepancy in common versions of this question. Based on the numbers provided, 90 km/h is the correct answer. If the time were 12 seconds, the answer would be 72 km/h.

100. A train is running at a speed of 90 km/h. If it crosses a signal in 10 seconds, the length of the train in metres is:

A) 150

B) 250

C) 300

D) 350

Answer: B) 250

Explanation:

Speed = 90 km/h = $90 \times \frac{5}{18} = 25$ m/s.

Length of train = Speed x Time = $25 \times 10 = 250$ m.