



Basic Formulae

Speed Time & Distance

Train Problems:

- Basic Concepts and Formulae-
Distance
- Speed = $\frac{\text{Distance}}{\text{Time}}$
- Time = Distance / Speed
- Distance = Speed \times Time
- 1 m/s = 18/5 Km/hr

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

$$\text{Relative Speed} = V_r = V_1 + V_2$$

$$V_r = V_1 - V_2$$

Boat & Stream Problem:

Let speed of boat = U Km/hr speed of stream = V Km/hr

- Downstream (when direction of stream and boat are same)
Relative Speed = U + V km/hr
- Upstream (when direction of stream and boat are opposite)
Relative Speed = U - V km/hr
- Speed of Boat U = (D + Up) / 2
- Speed of Stream V = (D - Up) / 2

Sheet-1

Speed Time & Distance: Train Problems

1. A 400m long train is running at 72 Kmph. how much time it will take to cross an electric pole?

A.) 15sec

B.) 20sec

C.) 19sec

D.) 21sec

2. A 180m long train is running at 54 Kmph. how much time it will take to cross a platform of 120m long?

A.) 20sec

B.) 22sec

C.) 19sec

D.) 18sec

5.4 km/hr. The train needs 8.4 and 8.5 seconds respectively to overtake them. What is the speed of the train if both the persons are walking in the same direction as the train?

A.) 96 km/hr

B.) 81 km/hr

C.) 51 km/hr

D.) 76 km/hr

9. Two trains are running at 40 km/hr and 20 km/hr respectively in the same direction. Fast train completely passes a man sitting in the slower train in 5 seconds. What is the length of the fast train?

A.) 27 m

B.) 33 m

C.) $27\frac{7}{9}$ m

D.) $23\frac{4}{9}$ m

10. Two, trains, one from Howrah to Patna and the other from Patna to Howrah, start simultaneously. After they meet, the trains reach their destinations after 9 hours and 16 hours respectively. The ratio of their speeds is:

A.) 2 : 3

B.) 6 : 7

C.) 4 : 3

D.) 9 : 16

11. A train crosses a tree in 120sec, while it crosses a 700m long platform in 190sec. the length of the Train is:

A.) 1500m

B.) 1400m

C.) 1300m

D.) 1200m

12. A 1200m long train crosses a tree in 120sec, how much time will I take to pass a platform 700m long?

A.) 180sec

B.) 190sec

C.) 170sec

D.) 175sec

13. A train is running at 72 Kmph. It was crossed an electronic pole in 20sec. find the length of the train?

A.) 300m

B.) 400m

C.) 250m

D.) 405m

14. A train is running at 108 Kmph. It was crossed an electronic pole in 28sec. find the length of the train?

A.) 480m B.) 840m

C.) 640m D.) 740m

15. A 180m long train is running at 72 Kmph. If it crossed the platform in 20sec. then find the platform Length?

A.) 210m B.) 220m

C.) 240m D.) 250m

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

A.) 150 m B.) 160 m

C.) 240 m D.) 250 m

17. 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/hr, what is the length of the platform?

A.) 150 m B.) 160 m

C.) 240 m D.) 250 m

18. The length of the bridge, which a train 130 metres long and travelling at 45 km/hr can cross in 30 seconds, is:

A.) 150 m B.) 160 m

C.) 240 m D.) 245 m

19. A train 125 m long passes a man, running at 5 km/hr in the same direction in which the train is going, in 10 seconds. The speed of the train is:

A.) 150 km/hr B.) 50 km/hr

C.) 75 km/hr

D.) 55 km/hr

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

A.) 3 : 2

B.) 1 : 3

C.) 3 : 7

D.) 3 : 4

Answer key

1 b 2 a 3 b 4 c 5 d 6 c 7 a 8 b 9 c 10 c 11 d 12 b 13 b 14 b 15 b 16 a 17 b 18 d 19 b 20 a

Speed Time & Distance: Boat and Stream Problems

A man's speed with the current is 15 km/hr and the speed of the current is 2.5 km/hr. The man's speed against the current is:

8.5km/hr 10 km/hr 12.5 km/hr 9 km/hr

A motorboat, whose speed in 15 km/hr in still water goes 30 km downstream and comes back in a total of 4 hours 30 minutes. The speed of the stream (in km/hr) is:

10 6 5 4

A man rows to a place 48 km distant and come back in 14 hours. He finds that he can row 4 km with the stream in the same time as 3 km against the stream. The rate of the stream is:

1 2 1.5 2.5

A boat running upstream takes 8 hours 48 minutes to cover a certain distance, while it takes 4 hours to cover the same distance running downstream. What is the ratio between the speed of the boat and speed of the water current respectively?

5:6 6:5 8:3 3:8

A man can row at 5 kmph in still water. If the velocity of current is 1 kmph and it takes him 1 hour to row to a place and come back, how far is the place?

3.2 km 3km 2.4km 3.6km

A boat takes 90 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the boat in still water is 10 mph, the speed of the stream is:

4mph 2.5mph 3mph 2mph

Tap 'A' can fill the tank completely in 6 hrs while tap 'B' can empty it by 12 hrs. By mistake, the person forgot to close the tap 'B', As a result, both the taps, remained open. After 4 hrs, the person realized the mistake and immediately closed the tap 'B'. In how much time now onwards, would the tank be full?

2hr 4hr 5hr 1hr

Two pipes A and B can fill a tank in 10 hrs and 40 hrs respectively. If both the pipes are opened simultaneously, how much time will be taken to fill the tank?

8hr 6hr 4hr 2hr

A man can row 40 kmph in still water and the river is running at 10 kmph. If the man takes 1 hr to row to a place and back, how far is the place?

16.5kmph 12.15kmph 2.25kmph 18.75kmph



Sheet-2

Speed Time & Distance: Train Problems

1. A goods train and a passenger train are running on the 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 1 min whereas a passenger on the passenger train marks that he crosses the goods train in $\frac{1}{3}$ min. If the speeds of the trains is in the ratio of 1 : 2, then find the ratio of their lengths.

- (a) 4 : 1 (b) 3 : 1 (c) 1 : 5 (d) 1 : 2 (e) None of these

2. A train running at the speed of 36 km/h goes past a pole in 15 s. What is the length of the train?

- (a) 150 m (b) 200 m (c) 250 m (d) 300 m (e) 350 m

3. A train crosses a platform in 30 s travelling with a speed of 48 km/h. If the length of the train be 200 m, then the length of the platform is

- (a) 420 m (b) 500 m (c) 300 m (d) 250 m (e) None of these

4. A train travelling with uniform speed crosses two bridges of lengths 240 m and 300 m in 18 s and 21 s, respectively. Find the speed of the train.

- (a) 72 km/h (b) 80 km/h (c) 45 km/h (d) 60 km/h (e) 90 km/h

5. From stations Manesar and Nainital, two trains start moving towards each other at speed 100 km/h and 75 km/h, respectively. When the two trains meet each other, it is found that one train covers 50 km more than another. Find the distance between stations.

(a) 180 km (b) 200 km (c) 255 km (d) 305 km (e) None of these

6. The distance between two stations Patiala and Rewadi is 205 km. A train with speed of 25 km/h leaves Patiala at 8:00 am towards Rewadi. Another train with speed of 35 km/h leaves Rewadi at 9 : 00 am towards Patiala. Then, at what time both trains meet?

(a) 12 : 00 am (b) 11 : 00 am (c) 9 : 30 pm (d) 11 : 30 am (e) 12 : 00 pm

7. A train leaves Manali for Gurgaon at 3 : 45 a.m. and goes at the rate of 50 km/h. Another train leaves Gurgaon for Manali at 2 : 35 a.m. and goes at the rate of 60 km/h. If the distance between both is 620 km, at what distance from Manali will the two trains meet?

(a) 200 km (b) 250 km (c) 145 km (d) 300 km (e) 375 km

8. The distance travelled by a train is 1830 km. The speed of the train is one more than twice the time taken to travel the distance. What will be the respective ratio of the time taken and speed of train?

(a) 30 : 61 (b) 61 : 30 (c) 25 : 51 (d) 51 : 25 (e) None of these

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

(a) 66 km/h (b) 72 km/h (c) 78 km/h (d) 81 km/h (e) None of the above

10. A 125 m long train takes 25 s to cross a person who is going in the same direction with the speed of 4 km/h. After crossing that person, the train can reach next station in 1 hr. How long that person takes to reach that station after being crossed by them?

(a) $4\frac{1}{4}$ h (b) $5\frac{3}{4}$ h (c) $3\frac{3}{4}$ h (d) $5\frac{1}{4}$ h (e) None of the above

Answer Key:

1. d
2. a
3. e
4. a
5. e
6. e
7. b
8. a
9. d
10. e

14. A man can row three-quarters of a kilometre against the stream in $11\frac{1}{4}$ minutes and down the stream in $7\frac{1}{2}$ minutes. The speed (in km/hr) of the man in still water is:

A. 4 kmph

B. 5 kmph

C. 6 kmph

D. 8 kmph

15. A boat takes 90 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the boat in still water is 10 mph, the speed of the stream is:

A. 4 mph

B. 2.5 mph

C. 3 mph

D. 2 mph

Answer Key:

1. B

2. C

3. C

4. A

5. A

6. A

7. C

8. B

9. C

10. D

11. B

12. A

13. C

14. B

15. D