

CAT-Level Time, Speed & Distance (TSD) - 20 Tough Questions

Relative Speed & Meeting Points

- 1. Two trains start from stations A and B towards each other at 60 km/h and 80 km/h. After meeting, they reach the opposite stations in 4 hours and 9 hours respectively. Find the distance between A and B.
- 2. A and B start from two points 120 km apart and move towards each other. A walks 5 km the first hour, 6 km the second, 7 km the third, and so on. B walks 50 km the first hour, 49 km the second, 48 km the third, and so on. After how many hours will they meet?
- 3. Two cyclists start 300 km apart, one at 20 km/h and the other at 25 km/h. At the same time, a bird starts from one cyclist and flies at 50 km/h back and forth until they meet. How far did the bird travel?

Trains

- 4. A train crosses a pole in 18 sec and a 270 m long platform in 30 sec. Find its length and speed.
- 5. Two trains of lengths 180 m and 220 m are running on parallel tracks in opposite directions. They cross each other in 12 sec. If the speed of the slower train is 54 km/h, find the speed of the faster train.
- 6. A train running at 72 km/h overtakes another train of half its length, running in the same direction, in 54 sec. If the slower train takes 90 sec to cross a platform 450 m long, find the length of each train.

Boats & Streams

- 7. A boat takes 2 hours to travel 16 km upstream and 1 hour to travel 24 km downstream. Find the speed of the boat in still water and the stream.
- 8. A man rows 20 km downstream in 2 hours and returns upstream in 5 hours. Find the speed of the boat and the stream.
- 9. A boat travels 12 km upstream and 12 km downstream in 5 hours. If it had gone 18 km downstream and 18 km upstream, it would have taken 8 hours. Find the speed of the boat and the stream.

Average Speed & Piecewise Motion

- 10. A car travels from A to B at 40 km/h and returns at 60 km/h. What is its average speed for the whole trip?
- 11. A man travels $\frac{1}{3}$ of the distance at 30 km/h, $\frac{1}{3}$ at 60 km/h, and the rest at 90 km/h. Find his average speed.
- 12. A truck moves at 45 km/h for the first 3 hours and at 60 km/h for the next 5 hours. Find the average speed for the entire journey.

Races

- 13. In a 200 m race, A beats B by 20 m and C by 40 m. By how many meters does B beat C in a 200 m race?

- 14. A runs 25% faster than B and gives B a start of 50 m in a 600 m race. Who wins and by what distance?
- 15. A and B run a 1000 m race. A gives B a start of 100 m and still beats him by 100 m. Find the ratio of their speeds.

Escalator Problems

- 16. A man goes up an escalator in 90 steps when it is not moving. When it moves at 4 steps per second, he takes 15 seconds less to ascend while walking at the same rate. Find his walking speed in steps per second.
- 17. A boy can go up an escalator in 50 steps, and down in 125 steps, both times taking 50 seconds. Find the number of visible steps on the escalator.
- 18. A man walks down an escalator at 5 steps/sec and reaches the bottom in 20 sec. If he stands still, the escalator takes 32 sec to take him down. Find the number of steps in the escalator.

Constant Time / Constant Speed Conditions

- 19. A man travels from A to B partly at 20 km/h and partly at 60 km/h. If he had traveled at 40 km/h throughout, he would have taken 2 hours less. Find the distance.
- 20. A train travels from A to B at a certain speed. If it had been 10 km/h faster, it would have taken 2 hours less. If it had been 10 km/h slower, it would have taken 3 hours more. Find the distance.