

How to use this sheet. Convert km/h to m/s by multiplying by $\frac{5}{18}$, and m/s to km/h by multiplying by $\frac{18}{5}$. For equal-distance average speed problems, never average the two speeds directly.

Quick reference — Downstream = boat + current, Upstream = boat – current · Average speed (equal distances) = $\frac{2xy}{x+y}$ · Same direction: relative speed = difference · Opposite direction: relative speed = sum

Section A

1. To convert a speed from km/h to m/s, you multiply by:

(1) $\frac{18}{5}$ (2) $\frac{3}{10}$ (3) $\frac{5}{18}$ (4) $\frac{10}{3}$

2. A speed of 60 km/h is equal to how many m/s (nearest whole number)?

(1) 15 (2) 17 (3) 20 (4) 12

3. A speed of 20 m/s is equal to how many km/h?

(1) 72 (2) 60 (3) 36 (4) 80

4. A train 100 m long crosses a pole in 10 seconds. Its speed is:

(1) 10 km/h (2) 36 km/h (3) 45 km/h (4) 50 km/h

5. Two trains, 120 m and 80 m long, run in opposite directions at 54 km/h and 36 km/h respectively. The time they take to cross each other is:

(1) 4 seconds (2) 6 seconds (3) 8 seconds (4) 10 seconds

6. A boat's speed in still water is 10 km/h, and the speed of the current is 2 km/h. The boat's downstream speed is:

(1) 12 km/h (2) 8 km/h (3) 20 km/h (4) 10 km/h

Section B

7. Using the same boat and current as above, the upstream speed is:

(1) 12 km/h (2) 8 km/h (3) 10 km/h (4) 2 km/h

8. A car covers the same distance at 40 km/h and returns at 60 km/h. Its average speed for the whole trip is:

(1) 50 km/h (2) 45 km/h (3) 52 km/h (4) 48 km/h

9. A man walks at 5 km/h for 3 hours. The distance he covers is:

(1) 10 km (2) 15 km (3) 20 km (4) 8 km

10. A car covers 300 km at a speed of 60 km/h. The time taken is:

(1) 4 hours (2) 6 hours (3) 5 hours (4) 5.5 hours

11. A cyclist covers 150 km at a speed of 50 km/h. The time taken is:

(1) 2 hours (2) 3 hours (3) 4 hours (4) 2.5 hours

12. Two cars travel in the same direction at 60 km/h and 40 km/h. Their relative speed is:

(1) 20 km/h (2) 100 km/h (3) 60 km/h (4) 40 km/h

13. Two cars travel in opposite directions at 60 km/h and 40 km/h. Their relative speed is:

(1) 20 km/h (2) 60 km/h (3) 40 km/h (4) 100 km/h

Section C

14. If a person covers 60 km in 5 hours, their speed is:

(1) 10 km/h (2) 15 km/h (3) 12 km/h (4) 20 km/h

15. If the speed of a vehicle is increased by 25% while the distance stays the same, the time taken decreases by:

(1) 25% (2) 20% (3) 15% (4) 30%

16. A train crosses a platform of length equal to its own length in 20 seconds, travelling at 36 km/h. The length of the train is:

(1) 100 m (2) 200 m (3) 150 m (4) 50 m

17. A and B start from the same point and walk in opposite directions at 4 km/h and 6 km/h. After 2 hours, the distance between them is:

(1) 10 km (2) 20 km (3) 12 km (4) 16 km

18. A does a journey in 6 hours at a certain speed. If the speed is doubled, the same journey would take:

(1) 12 hours (2) 4 hours (3) 3 hours (4) 2 hours

19. A boat travels 24 km downstream in 2 hours. Its downstream speed is:

(1) 10 km/h (2) 12 km/h (3) 8 km/h (4) 14 km/h

20. If the ratio of speeds of two vehicles covering the same distance is 3:4, the ratio of the times they take is:

(1) 3:4 (2) 2:3 (3) 1:1 (4) 4:3

Answer key: 1. (3) 2. (2) 3. (1) 4. (2) 5. (3) 6. (1) 7. (2) 8. (4) 9. (2) 10. (3) 11. (2) 12. (1) 13. (4) 14. (3) 15. (2) 16. (1) 17. (2) 18. (3) 19. (2) 20. (4)

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