

Name _____

CALCULATING SPEED AND VELOCITY

Speed measures of how fast or slow an object is moving. Velocity is a measure of speed in a specified direction. The units for both speed and velocity are both expressed as a specific distance traveled over a specific amount of time.

$$\text{SPEED} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{VELOCITY} = \frac{\text{Distance in a direction}}{\text{Time}}$$

Provide the appropriate speed, velocity, distance, or time. **CIRCLE YOUR ANSWER DON'T FORGET UNITS**

1. What is the velocity of a plane that travels 3,000 miles West in 5.0 hours?
2. If John takes 45 minutes to bicycle a total of four kilometers to his grandmother's house to the east, what is his velocity in km/hr?
3. What is the speed of a car that takes 1.5 hours to travel 75 kilometers?
4. If it takes 3.5 hours for a train to travel between two cities at a velocity of 120 miles/hr at 250 degrees, what is the distance between the two cities?
5. If a car is traveling at a velocity of 55 km/hr to the south, how long would it take for the car to travel a distance of 200 kilometers?
6. The Amazon River flows at an average speed of 5 km/hr. If you and a friend decide to drift down the river on a raft, how long will it take to drift a distance of 16 kilometers? (express the answer in hours and minutes)
7. If a plane travels North for 2.5 hours at a velocity of 100 km/hr, what distance did it travel?
8. If a girl is pedaling her bicycle at a velocity of 0.10 km/min East, how far will she travel in two hours?
9. Ants can carry food at a speed of 1 cm/s. How long will it take the ant to carry a cookie crumb a distance of 50 m from the kitchen table to the ant hill? (express the answer three different ways; in seconds, minutes and hours)
10. How many hours will it take a car to travel a distance of 750 km if it is traveling at 100 km/hr.?
11. A soccer player kicks a ball 6.5 meters. How much time is needed for the ball to travel this distance if its velocity is 22 meters per second, south?

12. A cruise ship travels east across a river at 19.0 meters per minute. If the river is 4,250 meters wide, how long does it take for the ship to reach the other side?
13. Joaquin mows the lawn at his grandmother's home during the summer months. Joaquin measured the distance across his grandmother's lawn as 11.5 meters. a. If Joaquin mows one length across the lawn from east to west in 7.10 seconds, then what is the velocity of the lawnmower? b. Once he reaches the edge of the lawn, Joaquin turns the lawnmower around. He mows in the opposite direction but maintains the same speed. What is the velocity of the lawnmower?
14. A family drives 881 miles from Houston, Texas to Santa Fe, New Mexico for vacation. How long will it take the family to reach their destination if they travel at a velocity of 55.0 miles per hour, northwest?
15. A shopping cart is pushed 15.6 meters west across a parking lot in 5.2 seconds. What is the velocity of the shopping cart?
16. Katie and her best friend Liam play tennis every Saturday morning. When Katie serves the ball to Liam, it travels 9.5 meters south in 2.1 seconds. a. What is the velocity of the tennis ball? b. If the tennis ball travels at constant speed, what is its velocity when Liam returns Katie's serve?
17. A driver realizes that she is traveling in the wrong direction on a one-way street. She has already driven 3.5 meters at a velocity of 16 meters per second, east before deciding to make a U-turn. How long did it take for the driver to realize her error?
18. John's mother drives 12.5 miles southwest to her favorite shopping mall. What is the velocity of her automobile if she arrives at the mall in 7.25 minutes?
19. A bus is traveling at 79.7 kilometers per hour east, how far does the bus travel 1.45 hours?
20. A girl scout troop hiked 5.8 kilometers southeast in 1.5 hours. What was the troop's velocity?
21. A volcanologist noted that a lahar rushed down a mountain at 32.2 kilometers per hour, south. How far did the mud flow in 17.5 minutes?

1. 600mi/hr W **2.** 5.3 km/hr E **3.** 50 km/hr **4.** 420 mi **5.** 3.63 hr **6.** 3.2 hr **7.** 250km N **8.** 12 km E **9.** 1.39 **10.** 7.5 hr **11.** .3s **12.** 13281s or 221 min **13.** 1.62m/s **b.** -1.62m/s **14.** 16hr **15.** 3m/s west **16.** 4.5m/s south **b.** 4.5 m/s north **17.** .22s **18.** 1.72 mi/min or 103 mi/hr **19.** 115.6km **20.** 3.7 km/hr SE **21.** 9.4km