

Module 1

Physics

Assignment #1

Read pages 1-13.

Write the answers on your own paper, not on this sheet.

1. List the SI unit for each measurement:
 - a. Distance
 - b. Time
 - c. Mass
2. Write each number in scientific notation:
 - a. 265000
 - b. 132 million
 - c. 0.0084
3. What is the difference between a scalar quantity and a vector quantity?
4. Which of these quantities are vector quantities: distance, displacement, velocity, speed?
5. Which of the following quantities are vectors?
 - a. 60 miles per hour
 - b. 15 meters to the left
 - c. 72 miles per hour
 - d. 44 feet at 30 degrees
6. A snail crawls to the left on a window sill 53.7 inches in the morning, turns around and travels right 16.2 inches in the afternoon, then turns around again and travels left 7.9 inches in the evening.
 - a. What distance did the snail travel?
 - b. What is the snail's final displacement?
7. A bike rider rode 42 miles north, and then she traveled 6 miles south. Her trip took 2 hours.
 - a. What distance did she travel?
 - b. What is her displacement?
 - c. What is her average speed?
 - d. What is her average velocity?
8. Honors – If 15 gleeqs equal 4 gnorfs, 11.2 gnorfs equal 7.3 brawks, and 1 brawk equals 12.8 eelms, calculate how many eelms are equals to 350.2 gleeqs.
9. Honors – A plane flies west for 846 km, then turns around and flies east. The plane lands at an airport 276 km away from where the pilot turned around. If the plane's average velocity for the entire trip was 45.0 m/sec, how many hours did the entire trip take?
10. Honors – A boat sails 90.0 km east at an average velocity of 12.0 km/hr. On its return trip, it sails 90.0 km west at an average velocity of 8.0 km/hr. What is the boat's average velocity over the entire trip?

Formulas:

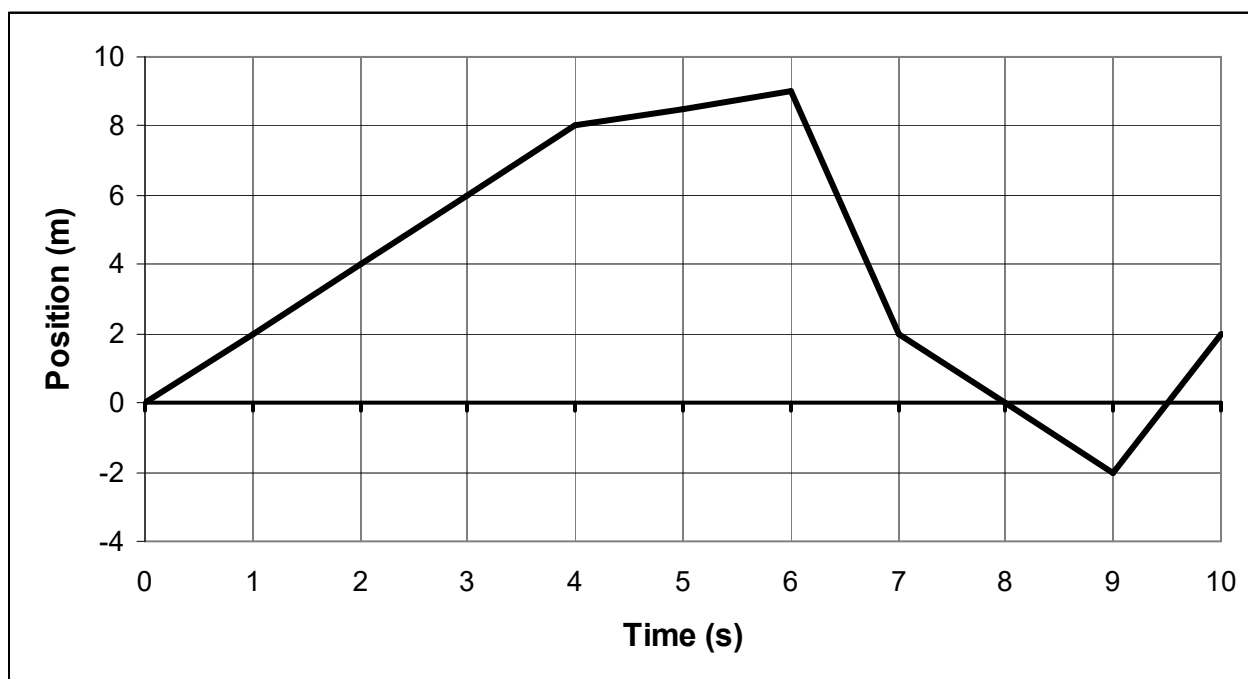
$$\text{Speed} = \frac{\text{Total Distance}}{\text{Time}}$$

$$\text{Average Velocity} = \frac{\Delta \text{ displacement}}{\Delta \text{ time}} = \frac{\text{Change in Position}}{\text{Time}}$$

11. Knox said the velocity of a car was 20 m/s. Connor said the car's velocity was -20 m/s. They are both right. Explain how that is possible.
12. An object's velocity is zero. Does this mean its acceleration is zero? Explain.
13. An object's acceleration is zero. Does this mean that its velocity is zero? Explain.
14. Is acceleration a scalar quantity or vector quantity?
15. A car's velocity is 22 m/s. Ten seconds later, the car's velocity is 40 m/s. What was the car's acceleration?
16. Braelyn's car was traveling at 25 m/s when a bunny jumped into the middle of the road. She slammed on the brakes and her car came to a stop in 4.8 seconds. What was the acceleration of the car?

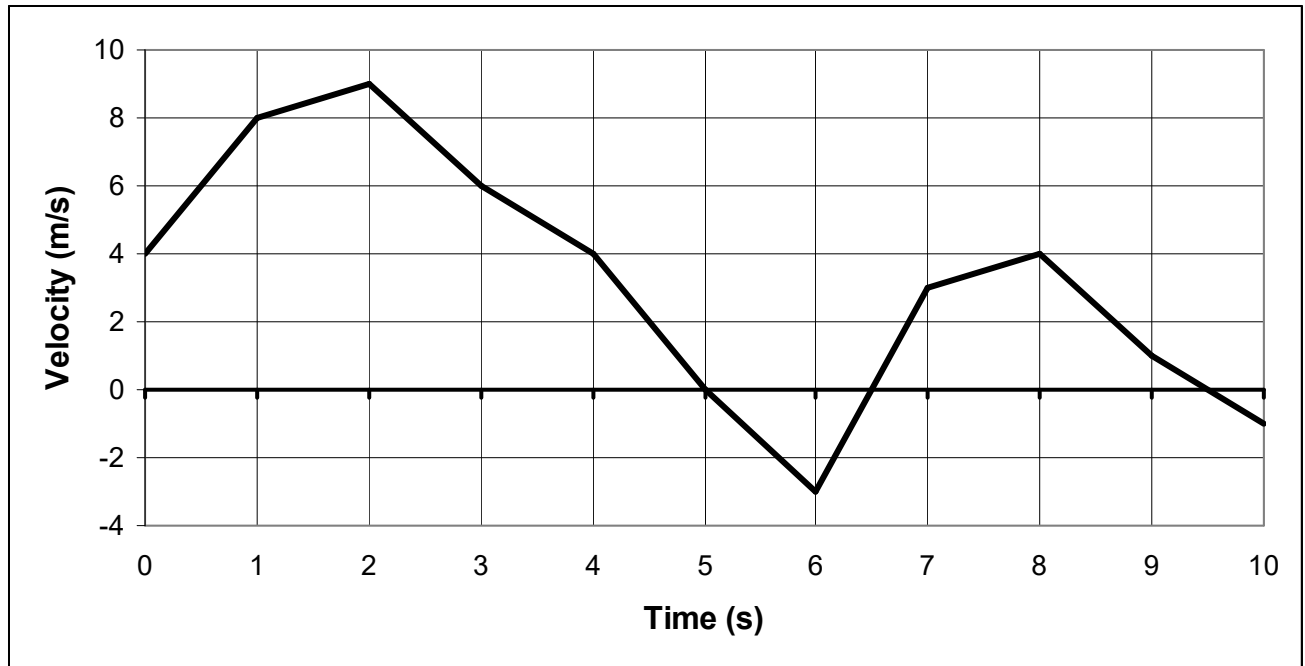


Use the graph below to answer Questions 16 - 19.



17. Is the object moving faster at 2 seconds or at 5 seconds? Explain.
18. What is the object's velocity at 6 seconds?
19. How many times did the object change direction?
20. **Honors** – Calculate the object's instantaneous velocity at 6.5 seconds.

Use the graph below to answer Questions 21 - 23.



21. When is the object stopped?
22. **Honors** – What is the acceleration of the object at 6.5 seconds?
23. **Honors** – Between what time intervals is the object speeding up? Explain.
24. **Honors** – The velocity of an object is -7.3 m/s. Its acceleration is +4.2 m/s². Is the object speeding up or slowing down?
25. **Honors** – A truck is traveling at a velocity of 27.5 m/s. If its brakes can apply a maximum acceleration of -0.50 m/s², how long will it take the truck to stop?

$$\text{Average Acceleration} = \frac{\Delta \text{ velocity}}{\Delta \text{ time}}$$