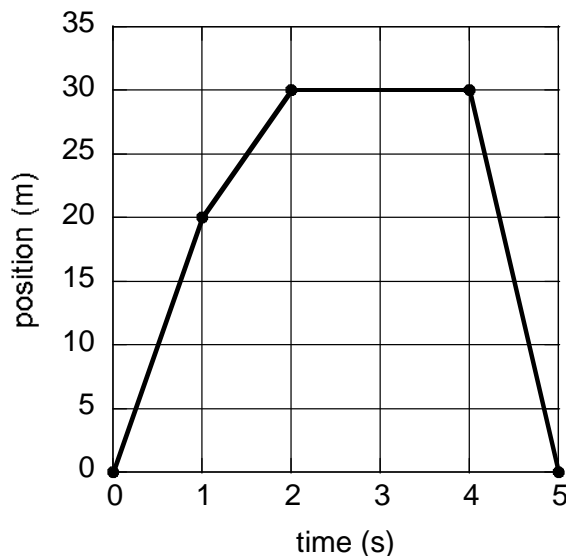


PHYS 1200 Physics of Everyday Experience

Review questions and exercises for Lecture 2 (M-1)

1. Who is known as the “Father of modern physics”?
2. Who made the first detailed measurements of the motion of a planet?
3. Who discovered the laws of planetary motion?
4. Who discovered the 3 laws of mechanics and the law of gravity?
5. Give 3 examples of the law of inertia.
6. What property of an object is a measure of its inertia?
7. What is your speed if (a) you travel a distance of 100 m in 25 seconds; (b) you travel 25 meters in 100 seconds?
8. How long will it take for train moving at 25 m/s to travel a distance of 50 m?
9. The position vs. time plot of an object is shown in the figure below.



What is the speed of the object in the following time intervals?

- (a) $t = 0$ and $t = 1$ s
- (b) $t = 1$ and $t = 2$ s
- (c) $t = 2$ and $t = 4$ s
- (d) $t = 4$ and $t = 5$ s?
- (e) Does the object change direction during any part of its motion?

10. Explain the difference between velocity and speed.
11. Which of the following units is (are) INCORRECT for the specification of speed?
(a) feet per month, (b) thousandths of an inch per decade, (c) meters per millimeters.
12. What is the physics principle behind the use of seatbelts?

Answers and Solutions

(It is very important that you try to answer the questions and work the exercises *before* reading the solutions.)

1. Galileo
2. Brahe
3. Kepler
4. Newton
5. Shaking your hands after washing to remove water; stomping your feet on the ground to remove snow from your shoes; pulling the cloth out from under the dishes.
6. mass is the measure of the inertia of an object
7. (a) $v = d/t = 100 \text{ m} / 25 \text{ s} = 4 \text{ m/s}$; (b) $v = 25 \text{ m} / 100 \text{ s} = 0.25 \text{ m/s}$
8. $v = d/t \rightarrow t = d/v = 50 \text{ m} / (25 \text{ m/s}) = 2 \text{ s}$.
9. (a) $v = d/t = 20 \text{ m} / 1 \text{ s} = 20 \text{ m/s}$; (b) $v = (30 \text{ m} - 20 \text{ m}) / 1 \text{ s} = 10 \text{ m} / 1 \text{ s} = 10 \text{ m/s}$; (c) zero;
(d) $v = 30 \text{ m} / 1 \text{ s} = 30 \text{ m/s}$; (e) From $t = 4$ to 5 s , the object changes direction and moves back to the starting point.
10. The velocity of an object is the quantity that conveys how fast an object is moving and in what direction it is moving. The speed is the magnitude of the velocity, it gives no indication of direction.
11. feet / month and thousandths of an inch per decade are proper units for speed (distance divided by time). Meters per millimeters is not a unit of speed.
12. If we are in a moving vehicle, we are moving. If the vehicle stops, we tend, because of our inertia, to continue moving, and the seatbelt prevents us from continuing to move as the vehicle comes to rest.