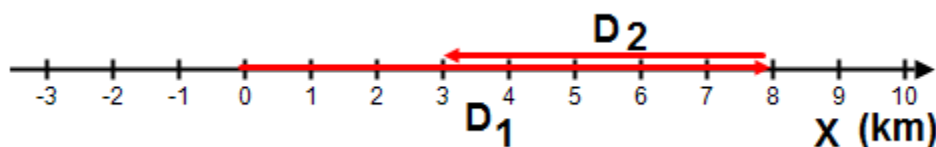


## Pre-Test

**Directions:** **STOP**, do not write on this test. All work is to be done on scrap paper. Fill in the appropriate answer on either the scan-tron sheet or on the answer sheet given for the test. All scrap paper must be turned in upon completion of the test.

**Multiple Choice Questions:**

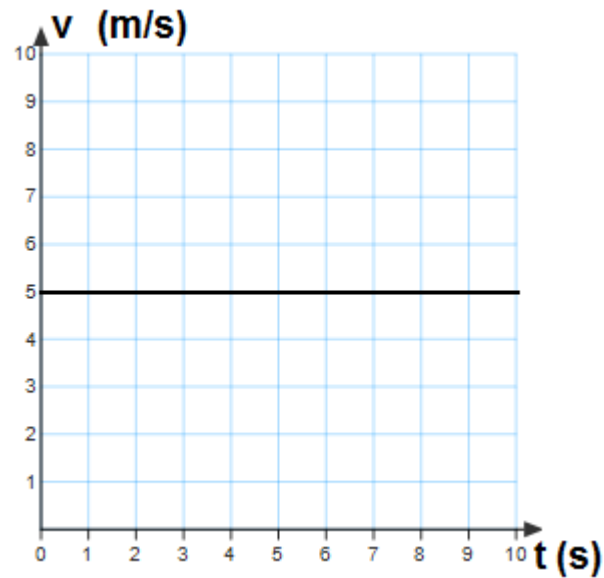
- An object moves at a constant speed of 6 m/s. This means that the object:
  - Increases its speed by 6 m/s every second
  - Decreases its speed by 6 m/s every second
  - Doesn't move
  - Has a positive acceleration
  - Moves 6 meters every second
- A train moves at a constant velocity of 50 km/h. How far will it move in 0.5 h?
  - 10 km
  - 20 km
  - 25 km
  - 45 km
  - 50 km
- A boat can move at a constant velocity of 8 km/h in still water. How long will it take for the boat to move 24 km?
  - 2 h
  - 3 h
  - 4 h
  - 6 h
  - 8 h
- A bicyclist moves at a constant speed of 4 m/s. How long it will take for the bicyclist to move 36 m?
  - 3 s
  - 6 s
  - 12 s
  - 9 s
  - 18 s



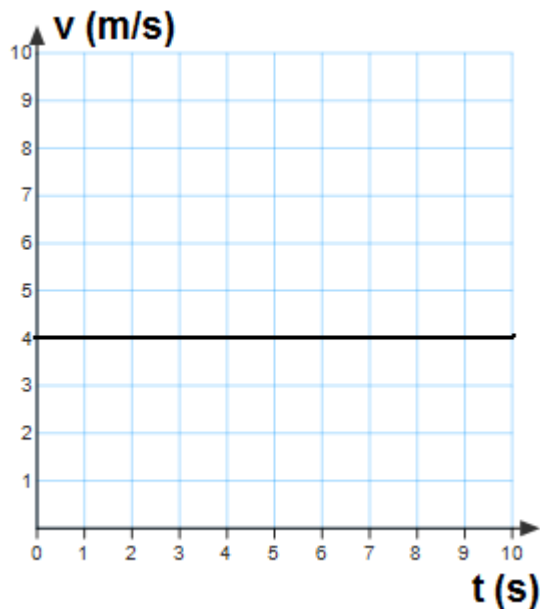
The diagram above illustrates a person who, starting from the origin, walks 8 km east during first day, and 5 km west the next day. Use it to answer questions 5 and 6.

- What is the net displacement of the person from the initial point in two days?
  - 6 km, east
  - 3 km, east
  - 10 km, west
  - 5 km, west
  - 9 km, east
- What is the traveled distance of the person from the initial point in two days?
  - 13 km
  - 3 km
  - 10 km
  - 5 km
  - 9 km

The graph represents the relationship between velocity and time for an object moving in a straight line. Use this graph to answer questions 7 and 8.

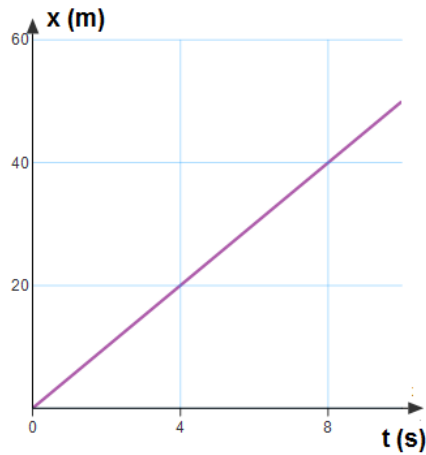


7. Which of the following statements is true?
- A. The object speeds up
  - B. The object slows down
  - C. The object moves with a constant velocity
  - D. The object stays at rest
  - E. The object is in free fall
8. What is the velocity of the object at 5 s?
- A. 1 m/s    B. 2 m/s    C. 3 m/s    D. 4 m/s    E. 5 m/s



9. The graph above represents the relationship between velocity and time for an object moving in a straight line. What is the traveled distance of the object at 9 s?
- A. 18 m    B. 24 m    C. 36 m    D. 40 m    E. 56 m

The following graph represents the position as a function of time for a moving object. Use this graph to answer questions 10 and 11.



10. Which of the following is true?

- a. The object increases its velocity
- b. The object decreases its velocity
- c. The object's velocity stays unchanged
- d. The object stays at rest
- e. More information is required

11. What is the velocity of the object?

- a. 4 m/s
- B. 20 m/s
- C. 8 m/s
- D. 40 m/s
- E. 5 m/s

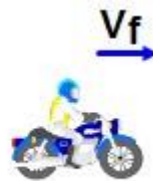
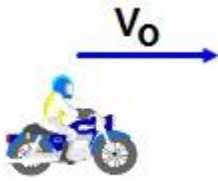
12. An object moves with a constant acceleration of  $5 \text{ m/s}^2$ . Which of the following statements is true?

- a. The object's velocity stays the same
- b. The object moves 5 m each second
- c. The object's acceleration increases by  $5 \text{ m/s}^2$  each second
- d. The object's acceleration decreases by  $5 \text{ m/s}^2$  each second
- e. The object's velocity increases by 5 m/s each second








13. A truck travels east with an increasing velocity. Which of the following is the correct direction of the car's acceleration?

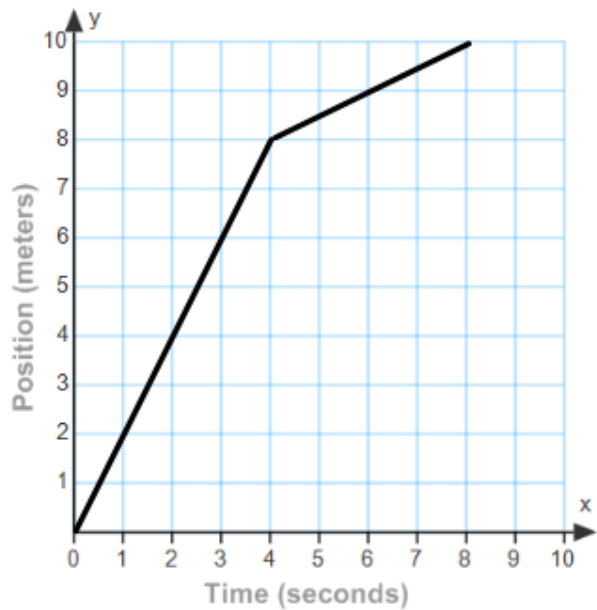
- A.
- B.
- C.
- D.
- E.



14. A motorbike travels east and begins to slow down before a traffic light. Which of the following is the correct direction of the motorbike's acceleration?

- A.       B.       C.       D.       E. 

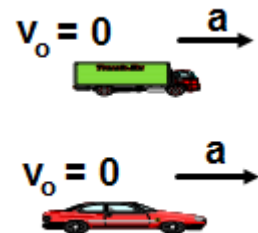
The position vs. time graph of a moving object is shown to the right. Use this graph to answer questions 15 through 18.



15. What is the average speed from 0 s to 4 s?  
 A. 0.5 m/s      B. 1 m/s      C. 2 m/s  
 D. 3 m/s      E. 4 m/s
16. What is the average speed from 4 s to 8 s?  
 A. 0.5 m/s      B. 1 m/s      C. 2 m/s  
 D. 3 m/s      E. 4 m/s
17. What is the object's position at 6 s?  
 A. 2 m      B. 1 m      C. 3 m  
 D. 7 m      E. 9 m
18. What is the average acceleration from 4 s to 8 s?  
 A. 0 m/s<sup>2</sup>      B. 1 m/s<sup>2</sup>      C. 2 m/s<sup>2</sup>      D. 3 m/s<sup>2</sup>      E. 4 m/s<sup>2</sup>

19. A car and a delivery truck both start from rest and accelerate at the same rate. However, the car accelerates for twice the amount of time as the truck. What is the traveled distance of the car compared to the truck?

- a. Half as much  
 b. The same  
 c. Twice as much  
 d. Four times as much  
 e. One quarter as much



20. An object is released from rest and falls in the absence of air resistance. Which of the following is true about its motion?
- Its acceleration is zero
  - Its acceleration is constant
  - Its velocity is constant
  - Its acceleration is increasing
  - Its velocity is decreasing

A ball is thrown straight up from point A, reaches a maximum height at point B, and then falls back to point C, as illustrated by the picture to the right. Use this for questions 21, 22, and 23.



21. Which of the following is true about the direction the ball's velocity and acceleration between A and B?

A.  $v \downarrow \quad \uparrow a$

B.  $v \uparrow \quad \downarrow a$

C.  $v \uparrow \quad \uparrow a$

D.  $v \downarrow \quad \downarrow a$

E.  $v = 0 \quad a = 0$

22. Which of the following is true about the direction the ball's velocity and acceleration between B and C?

A.  $v \downarrow \quad \uparrow a$

B.  $v \uparrow \quad \downarrow a$

C.  $v \uparrow \quad \uparrow a$

D.  $v \downarrow \quad \downarrow a$

E.  $v = 0 \quad a = 0$

23. Which of the following is true about the ball's velocity and acceleration the highest point B?

- Its velocity and acceleration are both zero
- Its velocity is up and non-zero constant and acceleration is zero
- Its velocity is down and non-zero constant and acceleration is zero
- Its velocity is zero and acceleration is up and non-zero constant
- Its velocity is zero and acceleration is down and non-zero constant

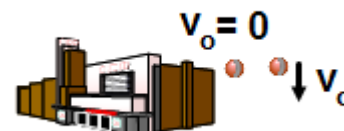
24. Two baseballs are thrown from the roof of a house with the same initial speed, one is thrown up, and the other is down. Compare the speeds of the baseballs just before they hit the ground.

- The one thrown up moves faster because the initial velocity is up
- The one thrown down moves faster because the initial velocity is down
- They both move with the same speed
- The one thrown up moves faster because it has greater acceleration
- The one thrown down moves faster because it has greater acceleration

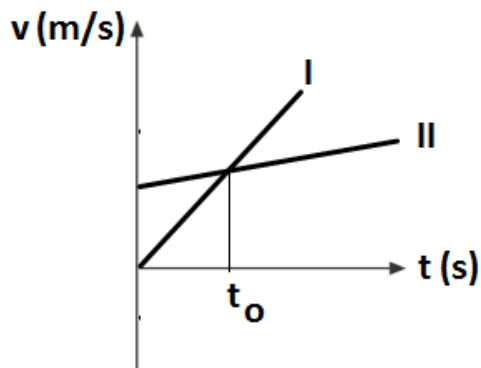


25. A tennis ball is dropped from the top of a tall building. A second tennis ball is thrown down from the same building. Make a statement about the acceleration of each tennis ball.

- The first ball falls with a greater acceleration
- The second ball falls with a greater acceleration
- They both fall with the same acceleration because they started from the same height
- They both fall with the same acceleration because they are in a free fall
- More information is required



**Bonus:** Two answers are correct below. Choose BOTH correct answers. 2pts.



- The velocity as a function of time of two moving objects is presented by the graph above. Which of the following is true?
  - At time  $t_0$  object I is behind object II
  - At time  $t_0$  object II is behind object I
  - Object I has a greater acceleration than object II
  - Object II has a greater acceleration than object I

