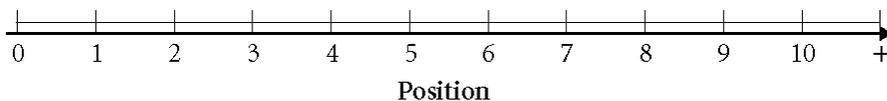


PH.Q1W2-HW

Multiple Choice

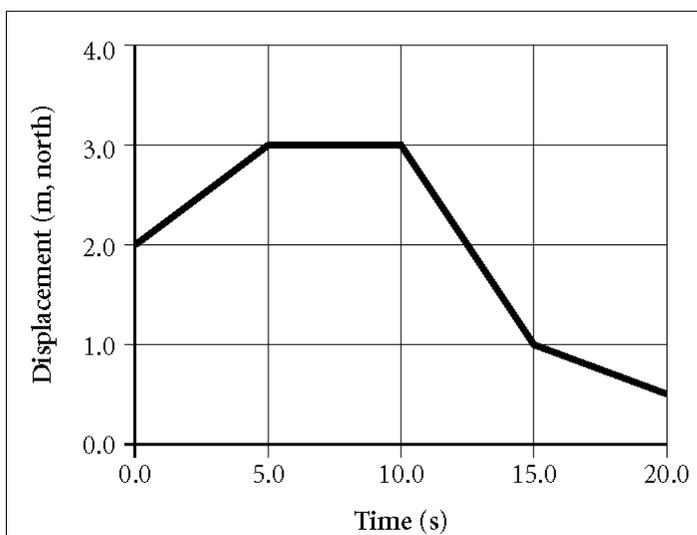
Identify the choice that best completes the statement or answers the question.

- ___ 1. What is the speed of an object at rest?
- a. 0.0 m/s
b. 1.0 m/s
c. 9.8 m/s
d. 9.81 m/s
- ___ 2. Which of the following is the equation for average velocity?
- a. $v_{avg} = \frac{\Delta x}{\Delta t}$
b. $v_{avg} = \frac{\Delta t}{\Delta x}$
c. $v_{avg} = \Delta x \Delta t$
d. $v_{avg} = \frac{v_i - v_f}{2}$
- ___ 3. Which of the following situations represents a negative displacement? (Assume positive position is measured vertically upward along a y-axis.)
- a. A cat stands on a tree limb.
b. A cat jumps from the ground onto a tree limb.
c. A cat jumps from a lower tree limb to a higher one.
d. A cat jumps from a tree limb to the ground.
- ___ 4. Which of the following units is the SI unit of velocity?
- a. meter
b. meter•second
c. meter per second
d. second per meter



- ___ 5. In the graph above, what is the correct description of any location to the left of the zero?
- a. negative displacement
b. negative distance
c. negative position
d. negative change of displacement
- ___ 6. In the graph above, a toy car rolls from +3 m to +5 m. Which of the following statements is true?
- a. $x_f = +3$ m
b. $x_i = +3$ m
c. $\Delta x = +3$ m
d. $v_{avg} = 3$ m/s
- ___ 7. Suppose you are given a position versus time graph. The slope of a line drawn tangent to a point on the curve of this graph describes what quantity?
- a. acceleration
b. displacement
c. instantaneous velocity
d. position

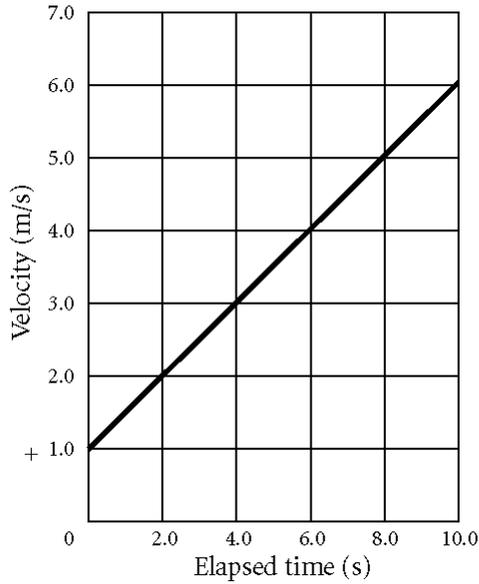
Motion of a Cat



- ___ 8. According to the graph above, during which interval is the cat at rest?
- 0.0–5.0 s
 - 5.0–10.0 s
 - 10.0–15.0 s
 - 15.0–20.0 s
- ___ 9. According to the graph above, the cat has the fastest speed during which interval?
- 0.0–5.0 s
 - 5.0–10.0 s
 - 10.0–15.0 s
 - 15.0–20.0 s
- ___ 10. According to the graph above, during which interval does the cat have the greatest positive velocity?
- 0.0–5.0 s
 - 5.0–10.0 s
 - 10.0–15.0 s
 - 15.0–20.0 s
- ___ 11. Which of the following line segments on a position versus time graph is physically impossible?
- a horizontal line
 - a straight line that slopes to the left
 - a straight line that slopes to the right
 - a vertical line
- ___ 12. Acceleration is defined as
- a rate of displacement.
 - the rate of change of displacement.
 - the change in velocity.
 - the rate of change of velocity.
- ___ 13. Which of the following is the equation for acceleration?
- $a = \frac{\Delta t}{\Delta v}$
 - $a = \frac{\Delta v}{\Delta t}$
 - $a = \Delta v \Delta t$
 - $\frac{v_i - v_f}{t_i - t_f}$
- ___ 14. What is the SI unit of acceleration?
- m/s
 - m^2/s
 - m/s^2
 - $\text{m} \bullet \text{s}^2$
- ___ 15. If you know the acceleration of a car, its initial velocity, and the time interval, which of the following can you predict?
- the direction of the car's final velocity
 - the magnitude of the car's final velocity
 - the displacement of the car
 - all of the above
- ___ 16. When a car's velocity is positive and its acceleration is negative, what is happening to the car's motion?

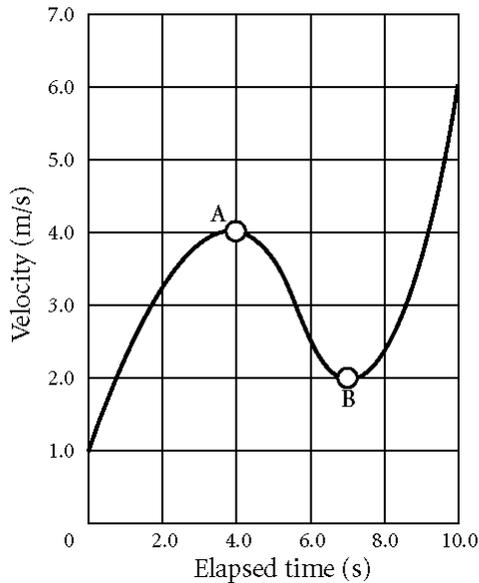
- a. The car slows down.
- b. The car speeds up.
- c. The car travels at constant speed.
- d. The car remains at rest.

17. When a car's velocity is negative and its acceleration is negative, what is happening to the car's motion?
- a. The car slows down.
 - b. The car speeds up.
 - c. The car travels at constant speed.
 - d. The car remains at rest.

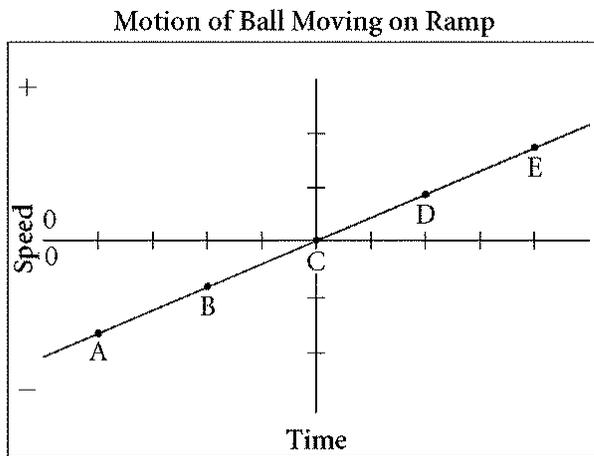


18. The graph above describes the motion of a cyclist. The graph illustrates that the acceleration of the cyclist
- a. is constant.
 - b. decreases.
 - c. increases.
 - d. is zero.

19. The graph above describes the motion of a cyclist. During the interval shown, the cyclist is
- a. slowing down.
 - b. speeding up.
 - c. traveling at the same speed.
 - d. at rest.

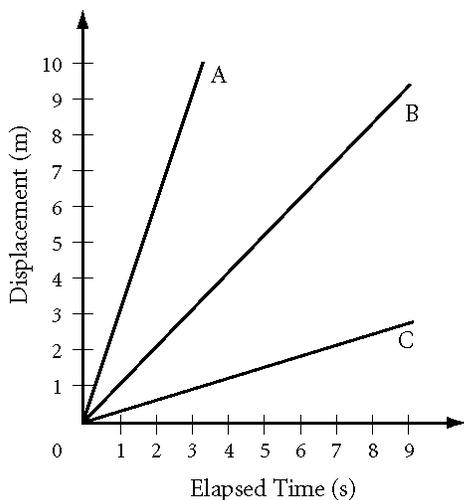


- ___ 20. What does the graph above illustrate about acceleration?
- The acceleration varies.
 - The acceleration is zero.
 - The acceleration is constant.
 - The acceleration increases then becomes constant.
- ___ 21. In the graph above, how does the acceleration at A compare with the acceleration at B?
- The acceleration at A is positive and less than the acceleration at B.
 - The acceleration at B is positive and less than the acceleration at A.
 - The accelerations at A and B are each zero.
 - The accelerations at A and B cannot be determined.
- ___ 22. Which of the following line segments on a velocity versus time graph is physically impossible?
- horizontal line
 - straight line with positive slope
 - straight line with negative slope
 - vertical line



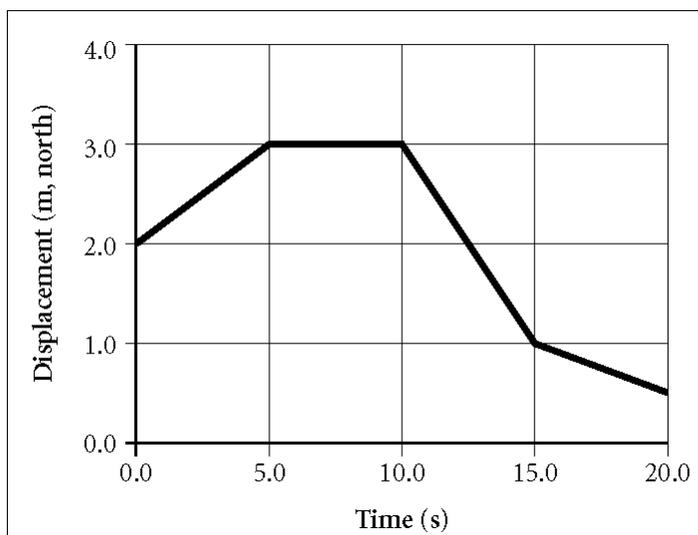
- ___ 23. The graph above describes the motion of a ball. At what point does the ball have an instantaneous velocity of zero?
- A
 - B
 - C
 - D
- ___ 24. The graph above describes the motion of a ball. At what point is the speed of the ball equal to its speed at B?
- A
 - C
 - D
 - none of the above
- ___ 25. The graph above describes the motion of a ball. At what point is the velocity of the ball equal to its velocity at B?
- A
 - C
 - D
 - none of the above
- ___ 26. The motion of a ball on an inclined plane is described by the equation $\Delta x = \frac{1}{2} a(\Delta t)^2$. Which of the following quantities must have a value of zero?
- x_i
 - x_f
 - v_i
 - t_f
- ___ 27. Acceleration due to gravity is also called
- negative velocity.
 - displacement.
 - free-fall acceleration.
 - instantaneous acceleration.

38. A stroller walks the first half of a straight 1.4 km trail at a steady pace of 1.7 m/s, east. He walks the second half at a constant stride of 0.37 m/s, east. What is his average velocity along the trail?



39. The graph above shows displacement versus time. What is the average velocity for line A?
 40. The graph above shows displacement versus time. What is the average velocity for line B?

Motion of a Cat



41. The graph above shows the motion of a cat. What is the cat's average velocity during the time interval 0.0–20.0 s?
 42. A shopping cart is given an initial velocity of 2.0 m/s and undergoes a constant acceleration of 2.0 m/s^2 . What is the magnitude of the cart's displacement after the first 6.0 s of its motion?
 43. A skater glides off a frozen pond onto a patch of ground at a speed of 2.9 m/s. Here she is slowed at a constant rate of 3.00 m/s^2 . How fast is the skater moving when she has slid 0.38 m across the ground?

44. A sports car traveling at 24.7 m/s slows at a constant rate to a stop in 16.00 s. What is the displacement of the sports car in this time interval?
45. A toy car is given an initial velocity of 7.0 m/s and experiences a constant acceleration of 1.0 m/s^2 . What is the final velocity after 6.0 s?
46. A soccer ball is moving horizontally at a speed of 4.0 m/s. It then undergoes a constant acceleration. After 8.00 s, the ball is moving at 4.8 m/s. What is the ball's displacement?
47. A race car accelerates from 0.0 m/s to 51.0 m/s with a displacement of 75.0 m. What is the car's acceleration?
48. A kitten pushes a ball of yarn rolling toward it at 14.00 cm/s with its nose, displacing the ball of yarn 9.43 cm in the opposite direction in 4.23 s. What is the acceleration of the ball of yarn?
49. Two cars pass each other traveling at the same speed. One car has a constant velocity of 19.0 m/s, east. The other car has a constant acceleration of 3.00 m/s^2 , west. How much time will have elapsed until the cars are 132 m apart?
50. Human reaction time is usually about 0.20 s. If your lab partner holds a ruler between your finger and thumb and releases it from rest without warning, how far can you expect the ruler to fall before you catch it? (Disregard air resistance. $a = -g = -9.81 \text{ m/s}^2$.)
51. A rock is thrown downward from the top of a cliff with an initial speed of 13 m/s. If the rock hits the ground after 2.7 s, what is the height of the cliff? (Disregard air resistance. $a = -g = -9.81 \text{ m/s}^2$.)
52. A rock is thrown straight upward with an initial velocity of 25.4 m/s where the acceleration due to gravity has a magnitude of 9.81 m/s^2 . What is the rock's displacement after 2.65 s?
53. A rock is thrown straight upward with an initial velocity of 6.4 m/s in a location where the acceleration due to gravity has a magnitude of 9.81 m/s^2 . To what height does it rise?
54. Someone throws a rubber ball vertically upward from the roof of a building 7.58 m in height. The ball rises, then falls. It just misses the edge of the roof, and strikes the ground. If the ball is in the air for 5.32 s, what was its initial velocity? (Disregard air resistance. $a = -g = -9.81 \text{ m/s}^2$.)
55. A pair of glasses are dropped from the top of a 36.0 m high stadium. A pen is dropped from the same position 2.22 s later. How high above the ground is the pen when the glasses hit the ground? (Disregard air resistance. $a = -g = -9.81 \text{ m/s}^2$.)