Name:_____Class:_____ Date:_____

Assessment

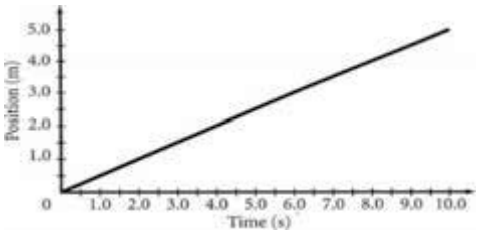
Chapter Test A

Teacher Notes and Answers

Motion in One Dimension

CHAPTER TEST A (GENERAL)

1. a
2. d
3. c
4. b
5. c
6. d
7. c
8. a
9. d
10. a
11. c
12. c
13. c
14. a
15. a
16. c
17. displacement
18. The dog is moving at a constant speed because the position versus time graph is a straight line with a positive slope.



19. 3.3 m/s, to the right

    Given

    $x_i = -12$ m

    $x_f = 24$ m

    $\Delta t = 11$ s

    Solution

    $$v_{avg} = \frac{\Delta x}{\Delta t} = \frac{x_f - x_i}{\Delta t} = \frac{(24\text{ m}) - (-12\text{ m})}{11\text{ s}} = 3.3\text{ m/s, to the right}$$

20. 44 m

    Given

    $a = -g = -9.81\text{ m/s}^2$

    $\Delta t = 2.0$ s

    $v_i = -12$ m/s

    Solution

    $$\Delta x = v_i\Delta t + \frac{1}{2}a(\Delta t)^2 = v_i\Delta t + \frac{1}{2}(-g)(\Delta t)^2$$

    $$\Delta x = (-12.0\text{ m/s})(2.0\text{ s}) + \frac{1}{2}(-9.81\text{ m/s}^2)(2.0\text{ s})^2 = -44\text{ m}$$

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Assessment

Motion in One Dimension

Chapter Test A

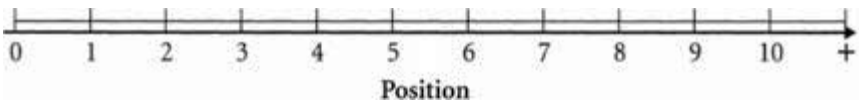
MULTIPLE CHOICE

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each 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 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.

_____ 3. Which of the following units is the SI unit of velocity?
a. meter
b. meter•second
c. meter per second
d. second per meter



_____ 4. 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

_____ 5. The slope of a line drawn tangent to a point on the curve of a position versus time graph describes what concept?
a. acceleration
b. displacement
c. instantaneous velocity
d. position

_____ 6. Acceleration is defined as
a. rate of displacement.
b. the rate of change of displacement.
c. the change in velocity.
d. the rate of change of velocity.

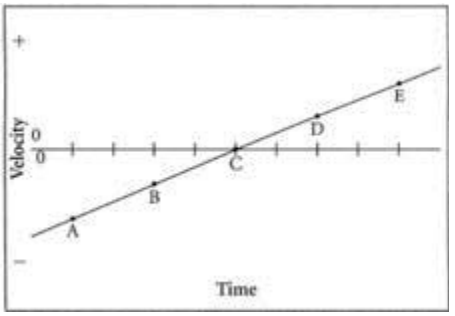
_____ 7. What is the SI unit of acceleration?
a. m/s
b. m^2/s
c. m/s^2
d. $m \cdot s^2$

_____ 8. If you know a car's acceleration, the information you must have to determine if the car's velocity is increasing is the
a. direction of the car's initial velocity.
b. direction of the car's acceleration.
c. initial speed of the car.
d. final velocity of the car.

_____ 9. If you know the acceleration of a car and its initial velocity, you can predict which of the following?
a. the direction of the car's final velocity
b. the magnitude of the car's final velocity
c. the displacement of the car
d. all of the above

_____ 10. 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.

_____ 11. The graph at right describes the motion of a ball. At what point does the ball have an instantaneous velocity of zero?
a. A
b. B
c. C
d. D



_____ 12. The motion of a ball on an inclined plane is described by the equation $\Delta x = 1/2a(\Delta t)^2$. This statement implies which of the following quantities has a value of zero?
a. x_i
b. x_f
c. v_i
d. t_f

_____ 13. Acceleration due to gravity is also called
a. negative velocity.
b. displacement.
c. free-fall acceleration.
d. instantaneous velocity.

_____ 14. When there is no air resistance, objects of different masses dropped from rest
a. fall with equal accelerations and with equal displacements.
b. fall with different accelerations and with different displacements.
c. fall with equal accelerations and with different displacements.
d. fall with different accelerations and with equal displacements.

_____ 15. Objects that are falling toward Earth in free fall move
a. faster and faster.
b. slower and slower.
c. at a constant velocity.
d. slower then faster.

_____ 16. Which would hit the ground first if dropped from the same height in a vacuum—a feather or a metal bolt?
a. the feather
b. the metal bolt
c. They would hit the ground at the same time.
d. They would be suspended in a vacuum.

SHORT ANSWER

17. What is the name of the length of the straight line drawn from an object's initial position to the object's final position?

_____

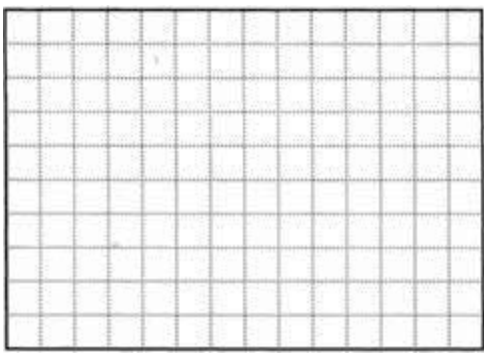
_____

18. Construct a graph of position versus time for the motion of a dog, using the data in the table at right. Explain how the graph indicates that the dog is moving at a constant speed.

Time (s)	Displacement (m)
0.0	0.0
2.0	1.0
4.0	2.0
6.0	3.0
8.0	4.0
10.0	5.0

_____

_____



PROBLEM

19. A horse trots past a fencepost located 12 m to the left of a gatepost. It then passes another fencepost located 24 m to the right of the gatepost 11 s later. What is the average velocity of the horse?

20. A rock is thrown downward from the top of a cliff with an initial speed of 12 m/s. If the rock hits the ground after 2.0 s, what is the height of the cliff? (Disregard air resistance. $a = -g = -9.81\ \text{m/s}^2$.)