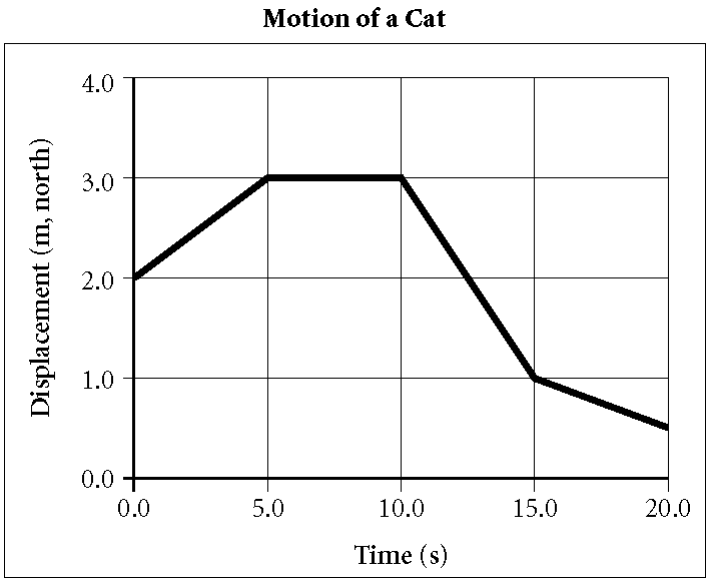
Name _____

Motion, Velocity, and Accleration

Multiple Choice



____ 1. According to the graph above, during which interval does the cat move backwards with the greatest velocity?
   a. 5.0–10.0 s
   b. 0.0–5.0 s
   c. 15.0–20.0 s
   d. 10.0–15.0 s

____ 2. According to the graph above, the cat has the Slowest speed during which interval?
   a. 5.0–10.0 s
   b. 10.0–15.0 s
   c. 0.0–5.0 s
   d. 15.0–20.0 s

____ 3. According to the graph above, during which interval is the cat at rest?
   a. 10.0–15.0 s
   b. 15.0–20.0 s
   c. 5.0–10.0 s
   d. 0.0–5.0 s

____ 4. Many cars are made with an automatic feature called cruise control. When the driver sets a car on cruise control, a computer adjusts the engine to maintain the car's speed constant. When a car is on cruise control on a straight road, the **velocity** of the car is best described as:
   a. equal to the initial speed when the cruise control was set.
   b. equal to zero.
   c. greater than it was before the cruise control was set.
   d. less than it was before the cruise control was set.

____ 5. Which of the following is a pair of vector quantities?
   a. Velocity — Distance
   b. Speed — Distance
   c. Speed — Displacement
   d. Velocity — Displacement

____ 6. The final position minus the initial position is the
   a. average velocity.
   b. motion diagram.
   c. displacement.
   d. time interval.

____ 7. Units of measurement used to label a quantity of acceleration are:
   a. cm/sec^2. b. sec^2/cm. c. cm/sec. d. cm^2/sec.

____ 8. Which of the following are the possible graph options for an accelertation verus time graph?

a. horizontal lines and lines with constant negative slope
b. horizontal lines, and lines with constant positive slope
c. horizonal lines only
d. Horizontal lines and lines with positive and negative constant slope.

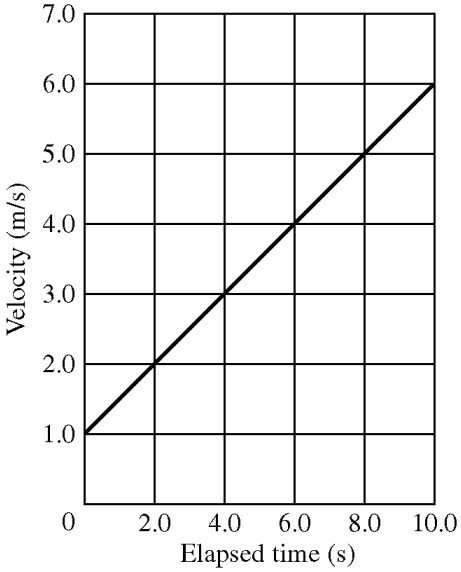
____ 9. Which of the following line segments on a position versus time graph is physically impossible?
a. a straight line that slopes to the left
b. a horizontal line
c. a straight line that slopes to the right
d. a vertical line

____ 10. Which of the following are a pair of scalar quantities?
a. Speed-- Distance
b. Velocity-- Displacement
c. Velocity-- Distance
d. Speed-- Displacement

____ 11. Acceleration is
a. displacement.
b. velocity.
c. the rate of change of displacement.
d. the rate of change of velocity.

____ 12. When a car's velocity is positive and its acceleration is negative, what is happening to the car's motion?
a. The car speeds up.
b. The car slows down.
c. The car remains at rest.
d. The car travels at constant speed.

____ 13. What does the graph above illustrate about acceleration?



a. The acceleration is constant.
b. The acceleration is zero.
c. There is not enough information to answer.
d. The acceleration decreases.

____ 14. When the velocity of a particle changes over time, the particle is said to be _____
a. accelerating
b. at rest
c. Constant
d. Both a and b

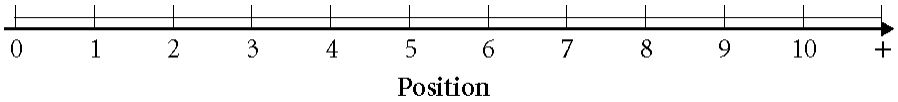
____ 15. Which of the following is the expression for average velocity?
a. $v_{avg} = \frac{v_i + v_f}{2}$
b. $v_{avg} = \frac{\Delta x}{\Delta t}$
c. $v_{avg} = \Delta x \bullet \Delta t$
d. $v_{avg} = \frac{\Delta t}{\Delta x}$

____ 16. The equation $v = v_0 + at$ relates which three variables?
a. Distance, speed, and time

b. Distance, acceleration, and time
c. Speed, acceleration, and time
d. Speed, acceleration, and distance

____ 17. What is the unit for displacement?

a. mm/s^2
b. mm/s
c. mm
d. kg/mm^3



____ 18. In the graph above, a toy car rolls from +9 m to +5m. Which of the following statements is true?

a. $\Delta x = +5$ m
b. $x_f = +5$ m
c. $v_{avg} = 5$ m/s
d. $x_i = +5$ m

Problems - Show ALL Work!! NO WORK = NO CREDIT!

19. Nate has reached the endzone of the stadium after intercepting the ball from Goose Creek and abruptly decelerates from 25m/s to 10 m/s in 3.5 seconds. Determine his acceleration rate **and** the distance she moved during this braking period

20. A sports car accelerates westward at a constant rate from rest to a velocity of 25.6 m/s in 14.00 s. What is the displacement of the sports car in this time interval?

21. Jacob is walking in the hallway and then increases his speed from zero to 7m/s when the warning bell begins to beep. He accelerates a rate of 0.4 m/s/s. How far did he walk to get to his classroom?

22. A hiker travels south along a straight path for 2.0 h with an average velocity of 0.66 km/h, then continues south along the same path for 1.5 h with an average velocity of 0.88 km/h. What is the hiker's displacement for the total trip?

23. A jet traveling at 45 m/s accelerates at 16 m/s^2 for 6.00 s. What is its final velocity?