Motion, Acceleration and Forces

Part A. Vocabulary Review

Directions: *Write the terms that match each description below in the spaces provided. The boxed letters will complete the sentence in number 13.*

1. equal forces acting in opposite directions (2 words)
2. unequal forces in opposite directions (2 words)
3. sum of all forces acting on an object (2 words)
4. total distance divided by total time (2 words)
5. force that acts in the opposite direction to the motion of a surface sliding on another surface
6. distance divided by time
7. a push or a pull exerted on a body or object
8. distance and direction of an object from its starting point
9. force that opposes the sliding motion of two surfaces in contact
10. force that opposes the motion of objects that move through the air
11. vector speed and direction of motion
12. speed of an object at a specific point in time (2 words)
13. The change in velocity divided by the time for the change to occur is called _____.
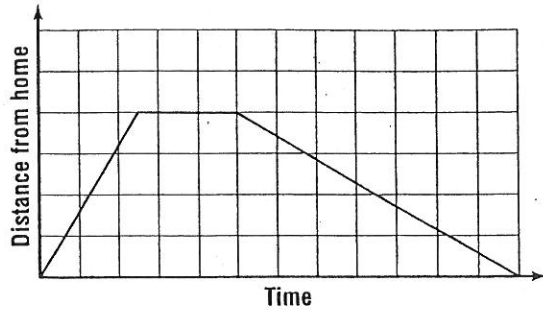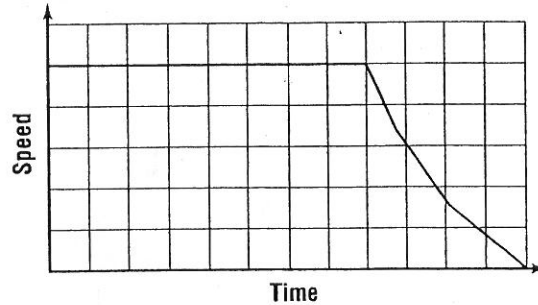
II. Understanding Concepts
Skills: Using Graphs

Directions: *Use the graphs below to answer the questions that follow.*

Graph 1   **Graph 2**

1. Graph 1 is a graph of a biker riding to a store. What can you tell about the motion of the bike rider in this figure?

   _____

2. What can you tell about the motion of the object in Graph 2?

   _____

3. What are the different labels on the graphs? What does each graph represent?

   _____

4. Do Graphs 1 and 2 represent the same object in motion? Explain.

   _____

   _____

Directions: *Complete the following sentences using the correct terms.*

5. Force created when an object on wheels moves over a surface is called _____.

6. An object slowing down has a _____ acceleration.

7. The velocity of an object must have both a _____ and

   a _____.

8. The equation $s = d/t$ is used to calculate the _____ of an object.

9. In the equation $s = d/t$, d stands for _____.

10. In the equation used to calculate acceleration, v_i stands for _____ and v_f

    stands for _____.

11. A car approaching a red traffic light has a _____ acceleration; when the

    light turns green, the car's acceleration is _____.

12. If the acceleration of a skateboarder is _____, the skateboarder may be soon coming to a stop.

13. A net _____ is necessary for an object to change its motion.

14. When the force of gravity equals the air resistance of a falling object, the object has reached its _____.

15. If two people push on an object between them with equal force but in opposing directions, the net force is _____.

16. _____ causes lighter objects to fall more slowly than heavier objects.

III. Applying Concepts

Directions: *Answer the following questions on the lines provided.*

1. Two people travel from Columbus to Cleveland, one by car at an average velocity of 90 km/h, and one by plane at an average velocity of 300 km/h. Can their displacements be equal? Explain.

_____

_____

2. A science book is being pushed across a table. Can the book have a constant speed and a changing velocity? Explain.

_____

_____

3. Could the book in question 2 have a changing speed and a constant velocity? Explain.

_____

_____

4. A science book is moved once around the perimeter of a table with the dimensions 1 m by 3 m. If the book ends up at its original position,
   a. What is its distance traveled?

   _____

   b. What is its displacement?

   _____

5. A person walking covers 5.20 m in 10.4 s. How fast is the person moving?

_____

_____

6. A car goes from 16 m/s to 2 m/s in 3.5 s. What is the car's acceleration?

_____

_____

IV.   Writing Skills

Directions: *Answer the following questions using complete sentences.*

1. Can the velocity of a car change when its acceleration is constant? Explain why or why not.

   _____

   _____

   _____

2. Explain why the second hands of a clock cannot travel at constant velocities.

   _____

   _____

   _____

3. In terms of positive, negative, and zero acceleration, how would you describe the motion of a student moving in a cafeteria lunch line?

   _____

   _____

   _____

4. Will all forces cause an object to accelerate? Explain.

   _____

   _____

   _____

5. If the net force acting on a body is zero, will the velocity be zero? Explain.

   _____

   _____

6. Explain what determines the size of a frictional force.

   _____

   _____

   _____