

#1 Speed (pages 332–334) Name: _____ Period: _____

Motion and Forces HW

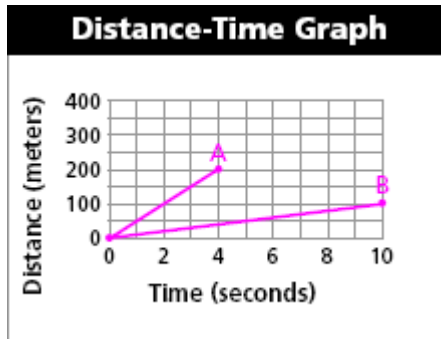
1. Define speed. _____

2. The equation used for calculating average speed is _____.
3. A student walked 1.5 km in 25 minutes, and then, realizing he was late, ran the remaining 0.5 km in 5 minutes. Calculate his average speed on the way to school.

Graphing Motion (page 334)

4. The slope of a line on a distance-time graph represents. _____

For questions 9 through 11, refer to the graph below.



5. Draw a point on the graph that represents 200 m traveled in 4 seconds. Draw a line connecting this point with the origin (0,0). Label this as line A.
6. Draw a point on the graph that represents 100 m traveled in 10 seconds. Draw a line connecting this point with the origin (0,0). Label this as line B.
7. Calculate the average speed (slope) of lines A and B. Be sure to include units. _____

Velocity (page 336)

8. How do speed and velocity differ? _____

9. Is the following sentence true or false? If a car travels around a gentle curve on a highway at 60 km/h, the velocity does not change. _____

Calculating Acceleration (pages 345–346)

10. Write the equation used to calculate the acceleration of an object.

11. Is the following sentence true or false? When the final velocity is less than the initial velocity of an object, the acceleration is negative. _____

Keep going this night's HW is two pages!

#2 Newton's First Law of Motion (pages 364–365)

1. Is the following sentence true or false? According to Newton's first law of motion, an object's state of motion does not change as long as the net force acting on it is zero. _____
2. Is the following sentence true or false? The law of inertia states that an object in motion will eventually slow down and come to a complete stop if it travels far enough in the same direction.

Newton's Second Law of Motion (pages 365–368)

3. According to Newton's second law of motion, acceleration of an object depends upon the _____ of the object and the _____ acting on it.
4. Is the following sentence true or false? The acceleration of an object is always in the same direction as the net force acting on the object. _____
5. Is the following sentence true or false? If the same force acts upon two objects with different masses, the acceleration will be greater for the object with greater mass. _____

Newton's Third Law (page 373)

6. According to Newton's third law of motion, what happens whenever one object exerts a force on a second object? _____

7. The equal and opposite forces described by Newton's third law are called _____ and _____ forces.
8. Circle the letters that identify each sentence that is true about action-reaction forces.
 - a. Newton's second law describes action-reaction forces.
 - b. Forces always exist in pairs.
 - c. Action-reaction forces never cancel.
 - d. All action-reaction forces produce motion.
9. Is the following statement true or false? Action-reaction forces do not cancel each other because the action force is always greater than the reaction force. _____

Teacher Stamp/Initial

#3 Momentum (pages 374–375)

1. Circle the letter of each factor that affects the momentum of a moving object.
a. mass b. volume c. shape d. velocity
2. If two identical objects are moving at different velocities, the object that is moving faster will have _____ momentum.
3. Your in-line skates are sitting in a box on a shelf in the closet. What is their momentum? _____
4. Is the following sentence true or false? An object with a small mass can have a large momentum if the object is traveling at a high speed. _____
5. Write the momentum formula, including the correct units.

6. Circle the letter of the object that has the greatest momentum.
a. a 700-gram bird flying at a velocity of 2.5 m/s
b. a 1000-kilogram car traveling at 5 m/s
c. a 40-kilogram shopping cart rolling along at 0.5 m/s
d. a 300-kilogram roller coaster car traveling at 25 m/s

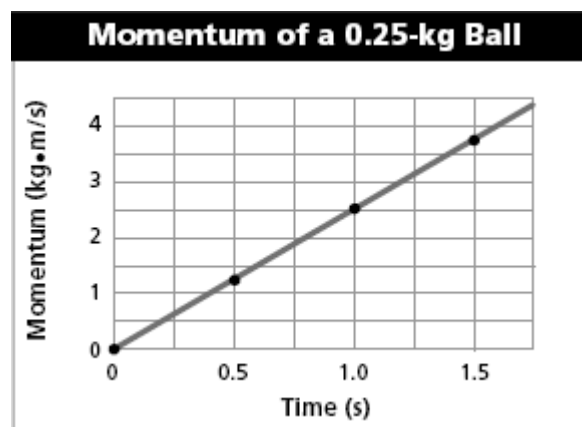
Conservation of Momentum (pages 376–377)

7. What does conservation of momentum mean? _____

8. According to the law of conservation of momentum, what happens to the total momentum of a system if no net force acts on the system?

9. Is the following sentence true or false? In a closed system with two objects, the loss of momentum of one object equals the gain in momentum of the other object. _____

For questions 10 and 11, refer to the graph below.



10. The momentum of the ball at one second is _____.
11. What is the speed of the ball at 0.5 seconds? Show your calculation. *Hint:* Solve the momentum formula for velocity.