

Chapter 3 Test Newton's First Law of Motion—Inertia

True or False Questions*Circle the correct answer.*

- T** **F** 1. The amount of matter in an object is called its weight.
- T** **F** 2. The SI unit force is called the kilogram.
- T** **F** 3. If a hockey puck slides on a perfectly frictionless surface, it will eventually slow down because of its inertia.
- T** **F** 4. Inertia is the reluctance any material object has to change in its state of motion.
- T** **F** 5. The combination of all the forces that act on an object is called the net force.

Multiple Choice Questions*Choose the best answer to each question and write the appropriate letter in the space provided.*

- _____ 6. The astronomer Copernicus was the first person to publicly state that Earth
- a. is the center of the solar system.
 - b. revolves around the sun.
 - c. does not move.
 - d. moves in a straight line.
- _____ 7. Whirl a rock at the end of a string and it follows a circular path. If the string breaks, the tendency of the rock is to
- a. follow a spiral path.
 - b. continue to follow a circular path.
 - c. follow a straight-line path.
- _____ 8. Galileo found that a ball rolling down one inclined plane would roll how far up another inclined plane?
- a. To nearly twice the height as where it originally started
 - b. To the nearly the same height as where it originally started
 - c. To nearly half its original height
 - d. To about one quarter its original height
- _____ 9. The law of inertia states that an object
- a. at rest will remain at rest unless acted on by an outside force.
 - b. will continue moving at the same velocity unless an outside force acts on it.
 - c. will continue moving in a straight line unless an outside force acts on it.
 - d. all of the above
- _____ 10. The law of inertia applies to
- a. moving objects.
 - b. objects at rest.
 - c. both moving and nonmoving objects.

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- _____ 11. After a cannon ball is fired into frictionless space, the amount of force needed to keep it going equals
- twice the force with which it was fired.
 - the same amount of force with which it was fired.
 - one half the force with which it was fired.
 - zero, since no force is necessary to keep it moving.
- _____ 12. Which has more mass, a kilogram of feathers or a kilogram of iron?
- The feathers
 - The iron
 - Neither. The masses are equal.
- _____ 13. A 10-N force and a 30-N force act on an object in opposite directions. What is the net force on the object?
- 40 N
 - 30 N
 - 20 N
 - 10 N

Math Problems

Solve the following problems in the space provided. Show all work.

14. On the surface of Jupiter the acceleration due to gravity is about 3 times that on Earth. How much would a 100 kg rock weigh on Jupiter?
15. The following forces act on an object: 20 N north, 50 N south, and 40 N west. What is the magnitude of the net force?

Essay Question

On a separate sheet of paper, answer the following question.

16. Write a short paragraph on the difference between mass and weight. Give examples.