

INQUIRY PHYSICS TEST REVIEW
Weight, Mass, Inertia, and the Laws of Motion

Name _____

In the space to the left, write the letter of the best answer to each question.

- _____ 1. The reason a tennis ball and a solid steel ball of the same volume will accelerate downward at the same rate (in the absence of air resistance) is that...
- A) the forces acting on them are the same size.
 - B) they each have the same mass.
 - C) the steel ball has more mass but also weighs more.
 - D) the tennis ball has more inertia than the steel ball.
- _____ 2. What must be overcome to throw an object **horizontally**?
- A) its weight
 - B) its inertia
 - C) its pull on the earth
 - D) its reaction force
- _____ 3. An object has a constant mass. A constant unbalanced force on the object will produce...
- A) constant acceleration.
 - B) constant velocity.
 - C) both of the above.
 - D) none of the above.
- _____ 4. If an object that is moving forward at a constant velocity is to be decelerated at a constant rate, what kind of force is needed?
- A) constant balanced forces
 - B) a steadily increasing backward force
 - C) none; inertia will stop the object
 - D) a constant unbalanced backward force
- _____ 5. Compared to an identical 10 kg object on the earth, a 10 kg object on the moon would have...
- A) less inertia.
 - B) the same inertia.
 - C) more inertia.

Show your work on calculations, and answer verbal questions with several complete sentences.

6. An object on Earth, where $g = 9.80 \text{ m/s}^2$, weighs 500 N . A different object on the planet *Venus* weighs 500 N there, where $g = 8.60 \text{ m/s}^2$.
- a. Calculate the mass of the object on Earth, and show your work.

 - b. Calculate the mass of object on Venus, and show your work.

 - c. Which object would be easier to move **horizontally**? **Explain** your answer.

7. When one of the Voyager probes was launched in 1977, scientists predicted that the spacecraft could be aimed to reach a star named "AC+79 3888" in about 60,000 years. Why would the spacecraft continue to travel for thousands of years after its power system had failed?
8. A force accelerates a mass at a certain rate. Insert the changes below into $a = F / m$ and then balance the equation to show how acceleration would change if the...
- force were the same, but the mass were halved.
 - the mass were the same, but the force were tripled.
 - the mass were halved **and** the force were tripled.
9. A 75.0 kg man is riding in an elevator which accelerates upward at 3.00 m/s^2 . What is the **size and direction** of the force the elevator floor applies to the man? Show your work.
10. Two children were fighting over a toy. A boy pulled with a horizontal force of 10.0 N upon the toy, while a girl pulled with a force of 20.0 N in the opposite direction. If the toy accelerated toward the girl at 2.00 m/s^2 , what is its mass? Show your work.