

## **Checkout Questions**

# **Lab 5. Force, Mass and Acceleration: What Is the Mathematical Relationship Among the Net Force Exerted on an Object, the Object's Inertial Mass, and Its Acceleration?**

1. In mathematics, two variables are proportional if a change in one variable is always accompanied by a change in another variable. Which, if any, variables from your investigation are proportional? You may choose more than one answer.
  - a. Force and mass
  - b. Force and acceleration
  - c. Mass and acceleration

What evidence do you have to support your claim?

Use the following information to answer questions 2–4. Two people are playing a game of tug-of-war with the rope attached to a mass of 25 kg at the center. The person pulling to the left pulls with a force of 20 N. The person pulling to the right pulls with a force of 10 N.

2. Which direction will the 25 kg mass move?
  - a. Left
  - b. Right
  - c. It will not move

How do you know?

3. What will the velocity of the mass be after 1 second?

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4. What will the velocity of the mass be after 2 seconds?
  
  
  
  
  
  
  
  
  
  
5. Two high school physics students are talking, and one says that an acceleration can cause a force, while the other says that a force causes an object to accelerate.
  - a. I agree with the first person.
  - b. I agree with the second person.

Use the concept of a cause-and-effect relationship to explain your answer.

6. Force is directly proportional to both mass and acceleration.
  - a. I agree with this statement.
  - b. I disagree with this statement.

Use the concept of a proportional relationship to explain your answer.

