Practice with Force

Name _____

For Review: Force = mass x acceleration **F=ma** (units = kg x m/s^2 = **Newtons**)

This formula can be rearranged to be: Acceleration = force / mass **A = f / m**

OR Mass = force / acceleration **M = f / a**

Example:

What do you know?	m=10 kg, a = 2 m/s^2
Use the formula	F = ma
Substitute	F = 10 kg x 2 m/s^2
Calculate	F = 10 x 2
Solve	Force = 20 Newtons

Solve the following problems. Show all your work. Be sure to check UNITS.

1. What's the force of a mass of 75 kg accelerating at 3 m/s^2 ?
2. What's the force of a mass of 100 kg accelerating at 5 m/s^2 ?
3. What's the force of a mass of 1,500 g accelerating at 25 m/s^2 ?
4. What's the force of a mass of 50,000 g accelerating at 20 m/s^2 ?
5. What's the acceleration of an object weighing 5 kg and experiencing a force of 10 N ?
6. What's the acceleration of a rocket with a motor giving 1000 Newtons of thrust, and which weighs 250 kg?
7. What's the acceleration of a car weighing 1,000 kg with an engine giving 500 N of force?
8. What's the force of an motorcycle weighing 150 kg, which started from rest and after 5 seconds was going 10 m/s?
9. What's the mass of an object accelerating at 10 m/s^2 from a force of 50 N?
10. What's the mass of an object accelerating at 50 m/s^2 from a force of 4,000 N?

Name Period Date

CHAPTER 11 | FORCES

Math Practice

Finding Force, Acceleration, and Mass

Solve each equation. Use correct units. Remember to show all work.

1. $m = 5$ kg, $a = 8$ m/s^2

   Solve for force. _____

2. $F = 75$ N, $a = 5$ m/s^2

   Solve for mass. _____

3. $m = 15$kg, $F = 60$ N

   Solve for acceleration. _____

4. $F = 12$ N, $a = 6$ m/s^2

   Solve for mass. _____

5. $F = 220$ N, $a = 11$ m/s^2

   Solve for mass. _____

6. $m = 7$ kg, $a = 5$ m/s^2

   Solve for force. _____

7. $m = 42$ kg, $a = 25$ m^2

   Solve for force. _____

8. $m = 75$ kg, $F = 425$ N

   Solve for acceleration. _____

9. $m = 27$ kg, $F = 108$ N

   Solve for acceleration. _____

Write and solve an equation to find the missing quantity.

10. A bowling ball with a mass of 7 kg leaves your hand with an acceleration of 63 m/s^2. What size force did you apply?

    _____

11. How much does a 5 kg cart accelerate when you lift it with exactly 45 N of force?

    _____

12. Suppose you and a classmate push a cart loaded with bricks to demonstrate force. You apply a force of 500 N, and the cart accelerates at a rate of 0.5 m/s^2. What mass does the cart have?

    _____

13. You push a merry-go-round on which your friend is riding. Your friend weighs 45 kg, and the merry-go-round weighs 163 kg. The merry-go-round leaves your hand with an acceleration of 52 m/s^2. What size force was applied?

    _____

14. It takes a force of about 45 N to lift your backpack. You lift it with an acceleration of 3 m/s^2. What is the mass of the backpack?

    _____