

Name: \_\_\_\_\_

\_\_\_\_\_ / 17

### **Chapter 6.3 Homework**

### **Conceptual Physics**

Parent Signature: \_\_\_\_\_

#### **Reviewing Concepts**

*Each numbered question is worth 1 point.*

18. A force acts on a moving object. The force makes the object \_\_\_\_\_ if it acts in the same direction as the velocity. The force makes it \_\_\_\_\_ if it acts opposite the direction of velocity. The force makes it \_\_\_\_\_ if it is perpendicular to the velocity.

19. A sports car moves around a sharp curve (small radius) at a speed of 50 mph. A four-door family car moves around a wider curve (large radius) at the same speed. The cars are equal in mass.

- a. Which car changes its direction more quickly?
- b. Which car has the greater acceleration?
- c. Which car has the greater centripetal force acting on it?
- d. What provides the centripetal force on each car?

20. Explain the relationship between velocity and centripetal force in creating circular motion.

21. Explain how the centripetal force needed to move an object in a circle is related to its mass, speed, and the radius of the circle.

22. A force is needed to change an object's linear motion. What is needed to change its rotational motion?

23. What is centrifugal force? Is it a real force?

24. What keeps the Moon in orbit around the Earth?

25. Is there a gravitational force between you and your pencil? Do you notice this force? Explain.

26. You experience a gravitational force that attracts you to Earth. Does Earth also experience a force? Explain.

27. What is a satellite?

28. Do all satellites move in perfect circles? Explain.

### **Solving Problems**

11. A car requires a centripetal force of 5,000 N to drive around a bend at 20 mph. What centripetal force is needed for it to drive around the bend at 40 mph? At 60 mph? (2)

12. A 1,000-kg car drives around a bend at 30 mph. A 2,000-kg truck travels around the same bend at the same speed. How does the centripetal force on the car compare to the force on the truck? (1)

13. What would happen to the force of gravity on you if you doubled your distance from the center of Earth? (1)

14. What would happen to the force of gravity on you if Earth's mass suddenly doubled but the radius remained the same? (1)

15. Use Newton's law of universal gravitation to find the force of gravity between Earth and a 60-kg person. (You will need to use a value from the Constants of Nature table on the inside back cover or your textbook.) (1)