Name _____ Class _____ Date _____

Circular Motion and Gravitation

Section Quiz: Circular Motion

Write the letter of the correct answer in the space provided.

_____ 1. Centripetal acceleration must involve a change in
   a. an object's tangential speed.
   b. an object's velocity.
   c. both an object's speed and direction.
   d. the radius of an object's circular motion.

_____ 2. What is the speed of an object in circular motion called?
   a. circular speed
   b. centripetal speed
   c. tangential speed
   d. inertial speed

_____ 3. Which of the following is the correct equation for centripetal acceleration?

   a. $a_c = \dfrac{v_t^2}{r}$

   b. $a_c = \dfrac{v_t}{r}$

   c. $a_c = \dfrac{mv_t^2}{r}$

   d. $a_c = \dfrac{(v_{t,f} - v_{t,i})}{\Delta t}$

_____ 4. What is the centripetal acceleration of a skater moving with a tangential speed of 2.0 m/s in a circular path with radius 2.0 m?
   a. 1.0 m/s²
   b. 2.0 m/s²
   c. 4.0 m/s²
   d. 8.0 m/s²

_____ 5. What term describes a force that causes an object to move in a circular path?
   a. circular force
   b. centripetal acceleration
   c. centripetal force
   d. centrifugal force

_____ 6. A centripetal force acts
   a. in the same direction as tangential speed.
   b. in the direction opposite tangential speed.
   c. perpendicular to the plane of circular motion.
   d. perpendicular to tangential speed but in the same plane.

Circular Motion and Gravitation *continued*

_____ **7.** Centripetal force can be calculated from centripetal acceleration by
   a. dividing by the mass.
   b. multiplying by the mass.
   c. squaring the acceleration and dividing by the radius.
   d. squaring the acceleration, multiplying by the mass, and dividing by the radius.

_____ **8.** Which of the following is due to inertia?
   a. A ball whirled in a circular motion stays in one plane.
   b. A ball whirled in a circular motion experiences centripetal acceleration directed toward the center of motion.
   c. A ball whirled in a circular motion experiences a centripetal force directed toward the center of motion.
   d. A ball whirled in a circular motion will move off in a straight line if the string breaks.

9. Describe the primary force or forces involved when a car executes a turn. Explain why passengers tend to lean or slide toward the outside of the turn.

_____

_____

_____

_____

_____

_____

10. A 1.3×10^3 kg car traveling with a speed of 2.5 m/s executes a turn with a 7.5 m radius of curvature. Calculate the centripetal acceleration of the car and the centripetal force acting on the car.