

Assessment

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
- an object's tangential speed.
 - an object's velocity.
 - both an object's speed and direction.
 - the radius of an object's circular motion.
- _____ 2. What is the speed of an object in circular motion called?
- circular speed
 - centripetal speed
 - tangential speed
 - inertial speed
- _____ 3. Which of the following is the correct equation for centripetal acceleration?
- $a_c = \frac{v_t^2}{r}$
 - $a_c = \frac{v_t}{r}$
 - $a_c = \frac{mv_t^2}{r}$
 - $a_c = \frac{(v_{t,f} - v_{t,i})}{\Delta t}$
- _____ 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?
- 1.0 m/s²
 - 2.0 m/s²
 - 4.0 m/s²
 - 8.0 m/s²
- _____ 5. What term describes a force that causes an object to move in a circular path?
- circular force
 - centripetal acceleration
 - centripetal force
 - centrifugal force
- _____ 6. A centripetal force acts
- in the same direction as tangential speed.
 - in the direction opposite tangential speed.
 - perpendicular to the plane of circular motion.
 - 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.