Concept Items

6.1 Angle of Rotation and Angular Velocity 1.

One revolution is equal to how many radians? Degrees?

a. 1\,\text{rev} = \pi\,\text{rad}=180^\circ
b. 1\,\text{rev} = \pi\,\text{rad}=360^\circ\!
c. 1\,\text{rev} = 2\pi\,\text{rad} = 180^\circ\!
d. 1\,\text{rev} = 2\pi\,\text{rad}=360^\circ

2.

What is tangential velocity?

a. Tangential velocity is the average linear velocity of an object in a circular motion.
b. Tangential velocity is the instantaneous linear velocity of an object undergoing rotational motion.
c. Tangential velocity is the average angular velocity of an object in a circular motion.
d. Tangential velocity is the instantaneous angular velocity of an object in a circular motion.

3.

What kind of motion is called *spin*?

a. Spin is rotational motion of an object about an axis parallel to the axis of the object.
b. Spin is translational motion of an object about an axis parallel to the axis of the object.
c. Spin is the rotational motion of an object about its center of mass.
d. Spin is translational motion of an object about its own axis.

6.2 Uniform Circular Motion 4.

What is the equation for centripetal acceleration in terms of angular velocity and the radius?

a. a_c = \frac{\omega^2\!}{r}
b. a_c = \frac{\omega}{r}
c. a_c = r\omega^2\!
d. a_c = r\omega\!

5.

How can you express centripetal force in terms of centripetal acceleration?

a. F_c = \frac{a_c^2\!}{m}
b. F_c = \frac{a_c}{m}
c. F_c = ma_c^2\!

d. F_c = ma_c

6.

What is meant by the word centripetal?

a. center-seeking
b. center-avoiding
c. central force
d. central acceleration

6.3 Rotational Motion

7.

Conventionally, for which direction of rotation of an object is angular acceleration considered positive?

a. the positive x direction of the coordinate system
b. the negative x direction of the coordinate system
c. the counterclockwise direction
d. the clockwise direction

8.

When you push a door closer to the hinges, why does it open more slowly?

a. It opens slowly because the lever arm is shorter so the torque is large.
b. It opens slowly because the lever arm is longer so the torque is large.
c. It opens slowly because the lever arm is shorter so the torque is less.
d. It opens slowly because the lever arm is longer so the torque is less.

9.

When is angular acceleration negative?

a. Angular acceleration is the rate of change of the displacement and is negative when \omega increases.
b. Angular acceleration is the rate of change of the displacement and is negative when \omega decreases.
c. Angular acceleration is the rate of change of angular velocity and is negative when \omega increases.
d. Angular acceleration is the rate of change of angular velocity and is negative when \omega decreases.