

Section Study Guide

Teacher Notes and Answers

CIRCULAR MOTION

1.
 - a. yes
 - b. The car has a non-zero acceleration because the direction of motion is changing.
 - c. The direction of centripetal acceleration is toward the center of the circle. In this case, the direction is toward the center of the Ferris wheel.
 - d. $4.8 \times 10^{-2} \text{ m/s}^2$
2.
 - a. the wire
 - b. centripetal force
 - c. The centripetal force acts toward the center of the circular motion.
 - d. inertia
 - e. 32.0 m/s

Circular Motion and Gravitation

Concept Review

Circular Motion

1. A Ferris wheel car is moving in a circular path at a constant speed.
 - a. Is the car accelerating? _____
 - b. How can the car have a non-zero acceleration if the speed is constant?

 - c. What is the direction of centripetal acceleration?

 - d. What is the magnitude of the centripetal acceleration if the tangential speed of the car is 2.0 m/s and the radius of the wheel is 83 m?

2. The hammer throw is a track-and-field event in which the thrower swings a heavy metal ball (the “hammer”) on a wire in a circular motion, then releases the wire, sending the hammer flying.
 - a. What provides the force to keep the hammer moving in a circle before the wire is released?

 - b. What is the name for this force? _____
 - c. In what direction does this force act? _____

 - d. What is the term for the hammer’s tendency to move in a straight line?

 - e. Suppose the hammer has a mass of 7.26 kg, the wire is 1.00 m long, and the force keeping the hammer moving in a circle is 7.43×10^3 N. What will the hammer’s speed be when the thrower releases the wire?