

Chapter 5 Assignment 3



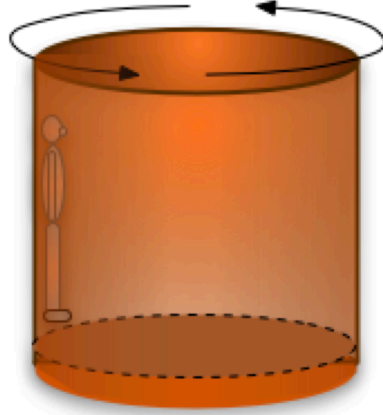
1. “Hold on tight! This 40-60 passenger swinging ship swings at 39 feet per second at a 65° angle. If you enjoy swinging sensations, The Pharaoh’s Fury is a great ride for you!” So, I take it that the maximum speed is 39 ft/s, and that would be at the bottom of the swing. The radius from the axis to the riders is about 10. m. Let’s say our person of interest has a mass of 60. kg,

(a) Sketch and label a force diagram for that person when at the bottom of the swing,

- (b) Find the magnitude and direction of the acceleration of that person when passing through the lowest point in the swing.

- (c) Find the magnitude and direction of the net force acting on the person at this lowest point.

- (d) Find the magnitude of each force acting on the person.



2. The Cajun Cliffhanger was a ride at Great America in which you stood with your back to the inside wall of a vertical cylinder. The cylinder begins to rotate, and when it is moving around pretty fast, the floor beneath you is lower. You do not slide down, however, because of the friction between you and the wall. Your mass is 60 kg. The Cliffhanger cylinder has a radius of about 2.9 m. It goes around about once per 2.9 second.

(a) Sketch and label a force diagram for the person in the position shown.

(b) Find the magnitude and direction of the acceleration of the person in the position shown.

(c) Find the magnitude and direction of the net force acting on the person.

(d) Determine the magnitude of each force in your force diagram.



3. The softball pitcher shown above delivers a pitch with a speed of 70 mph. The 0.19 kg ball is about 0.7 m from her shoulder, the center of the motion.

(a) Sketch and label a force diagram for the ball when at the bottom of its motion just before the pitcher releases it.

(b) Find the magnitude and direction of the acceleration of the ball when it is at the bottom position.

(c) Find the magnitude and direction of the net force acting on the ball.
