SECTION REVIEW

1. Determine whether each of the following situations involves linear motion, rotational motion, or a combination of the two.
   - **a.** a baseball dropped from the roof of a house
   - **b.** a baseball rolling toward third base
   - **c.** a pinwheel in the wind
   - **d.** a door swinging open

2. What quantity describes the ability of a force to rotate an object? How does it differ from a force? On what quantities does it depend?

3. How would the force needed to open a door change if you put the handle in the middle of the door?

4. What are three ways that a cat pushing on a cat-flap door can change the amount of torque applied to the door?

5. The efficiency of a squeaky pulley system is 73 percent. The pulleys are used to raise a mass to a certain height. What force is exerted on the machine if a rope is pulled 18.0 m in order to raise a 58 kg mass a height of 3.0 m?

6. A person lifts a 950 N box by pushing it up an incline. If the person exerts a force of 350 N along the incline, what is the mechanical advantage of the incline?

7. You are attempting to move a large rock by using a long lever. Will the work you do on the lever be greater than, the same as, or less than the work done by the lever on the rock? Explain.

8. **Interpreting Graphics** Calculate the torque for each force acting on the bar in **Figure 22.** Assume the axis is perpendicular to the page and passes through point *O*. In what direction will the object rotate?

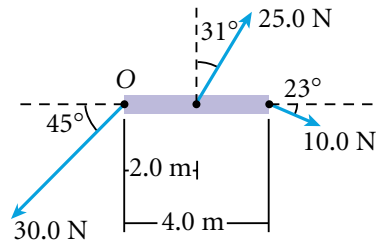

Figure 22

9. **Interpreting Graphics** **Figure 23** shows an example of a Rube Goldberg machine. Identify two types of simple machines that are included in this compound machine.

Figure 23

10. **Critical Thinking** A bicycle can be described as a combination of simple machines. Identify two types of simple machines that are used to propel a typical bicycle.