

31. ● You swing a 2.2 kg stone in a circle of radius 75 cm. At what speed should you swing it so its centripetal acceleration will be  $9.8 \text{ m/s}^2$ ?
33. ●● Consult Appendix E and assume circular orbits. (a) What is the magnitude of the orbital velocity, in  $\text{m/s}$ , of the earth around the sun? (b) What is the radial acceleration, in  $\text{m/s}^2$ , of the earth toward the sun? (c) Repeat parts (a) and (b) for the motion of the planet Mercury.
34. ● A model of a helicopter rotor has four blades, each 3.40 m in length from the central shaft to the tip of the blade. The model is rotated in a wind tunnel at  $550 \text{ rev/min}$ . (a) What is the linear speed, in  $\text{m/s}$ , of the blade tip? (b) What is the radial acceleration of the blade tip, expressed as a multiple of the acceleration  $g$  due to gravity?
36. ● A curving freeway exit has a radius of 50.0 m and a posted speed limit of 35  $\text{mi/h}$ . What is your radial acceleration (in  $\text{m/s}^2$ ) if you take this exit at the posted speed? What if you take the exit at a speed of 50  $\text{mi/h}$ ?