

- 1.** A spherical balloon is deflating, losing 40 cubic centimeters of air every second. How fast is the radius of the balloon decreasing when the balloon contains 120 cubic centimeters of air?
  
- 2.** You're standing in a field when you notice a spaceship on the ground 100 feet in front of you. The aliens in the spaceship see you and panic. As you watch, the spaceship shoots straight up into the air at a rate of 400 feet per minute. How fast is the angle of inclination of your line of sight increasing at the instant that the spaceship is 1000 feet off the ground?
  
- 3.** While chatting at the water cooler, you notice that your friend's cup is leaking water at a rate of half a cubic inch of water per minute. The paper cups in your office are conical and measure 4 inches across and 6 inches deep. How fast is the water level in your friend's cup dropping when the water in the cup is 3 inches deep?