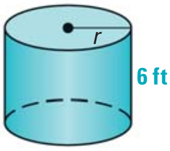
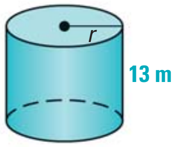
CHALLENGE **Use the given surface area S of the cylinder to find the radius r to the nearest tenth. (Use 3.14 for π.)**

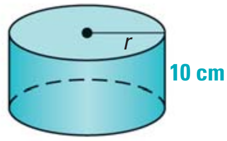
47. $S = 251 \text{ ft}^2$



48. $S = 716 \text{ m}^2$



49. $S = 1074 \text{ cm}^2$



PROBLEM SOLVING

GRAPHING CALCULATOR **You may wish to use a graphing calculator to complete the following Problem Solving exercises.**

EXAMPLE 6 on p. 646 for Exs. 50–52

50. SOCCER The height y (in feet) of a soccer ball after it is kicked can be modeled by the graph of the equation $y = -0.04x^2 + 1.2x$ where x is the horizontal distance (in feet) that the ball travels. The ball is not touched, and it lands on the ground. Find the distance that the ball was kicked.

TEXAS @HomeTutor for problem solving help at classzone.com

51. SURVEYING To keep water off a road, the road's surface is shaped like a parabola as in the cross section below. The surface of the road can be modeled by the graph of $y = -0.0017x^2 + 0.041x$ where x and y are measured in feet. Find the width of the road to the nearest tenth of a foot.

TEXAS @HomeTutor for problem solving help at classzone.com

52. DIVING During a cliff diving competition, a diver begins a dive with his center of gravity 70 feet above the water. The initial vertical velocity of his dive is 8 feet per second.

a. Write an equation that models the height h (in feet) of the diver's center of gravity as a function of time t (in seconds).

b. How long after the diver begins his dive does his center of gravity reach the water?

53. **TAKS REASONING** An arc of water sprayed from the nozzle of a fountain can be modeled by the graph of $y = -0.75x^2 + 6x$ where x is the horizontal distance (in feet) from the nozzle and y is the vertical distance (in feet). The diameter of the circle formed by the arcs on the surface of the water is called the display diameter. Find the display diameter of the fountain. *Explain* your reasoning.