Name: Date:
Instructor: Section:

Practice Set 8.3

Solve for the indicated value. Assume the indicated variable is greater than 0.

1. $d = \dfrac{(V_0)^2}{2\mu g}$, for V_0
braking distance

2. $S = 4\pi r^2$, for r
surface area of a sphere

3. $A = \dfrac{1}{2}x^2\sqrt{3}$, for x
area of an equilateral triangle

4. $s = \dfrac{x}{360} \cdot \pi r^2$ for r
area of a sector

Problem Solving

5. Use the profit formula $P(n) = 1.5n^2 - 77n + 5$, where $P(n)$ is the profit in hundreds of dollars and n is the number of lawnmowers sold. How many lawnmowers should be sold to break even?

6. The Jefferson National Expansion Memorial in St. Louis, Missouri, is an arch in the shape of an inverted catenary – the curve of a hanging chain. The curve of the gateway arch closely follows the equation $h(x) = \dfrac{1}{630}x^2 - 2x + 630$, where x is the distance to the ground in feet from the center of the arch, and $h(x)$ is the height of the arch in feet at x. Use $h(0)$ to find the height of the arch at its center. [Source: nps.gov]

7. LaToya Skinner jogs up a hill for 1 mile and then turns around and jogs back down. Her speed uphill is 2 mph less than her speed downhill. If she spends a total of 25 minutes jogging ($\dfrac{5}{12}$ hour), find her speed uphill and downhill.

8. Sue Neufeld wishes to enclose a rectangular play area that has an area of 6000 ft^2. If she only has 320 feet of fencing, find the dimensions of the rectangular region.

9. Elizabeth Brookes stands on top of the 40-foot bleachers and throws a ball upward with an initial velocity of 44 ft/sec. How long does it take the ball to hit the ground below the bleachers?
($h = \dfrac{1}{2}gt^2 + v_0t + h_0$, $g = -32$ ft/sec^2)

10. Rosella and Leonard take 4 hours working together to cane an antique chair. Working alone, Rosella can complete the job 45 minutes faster than Leonard. What are their rates working alone?

