54. **TAKS REASONING** In a particular region, the population C of coyotes (the predator) and the population R of rabbits (the prey) can be modeled by

$$C = 9000 + 3000 \sin \frac{\pi}{12}t \quad \text{and} \quad R = 20{,}000 + 8000 \cos \frac{\pi}{12}t$$

where t is the time in months.

a. Determine the ratio of rabbits to coyotes when $t = 0$, 6, 12, and 18 months.

b. Graph both functions in the same coordinate plane.

c. Use the graphs to explain how the changes in the two populations appear to be related.

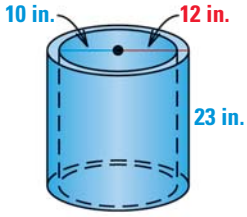
55. **CHALLENGE** Suppose a Ferris wheel has a radius of 25 feet and operates at a speed of 2 revolutions per minute. The bottom car is 5 feet above the ground. Write a model for a person's height h (in feet) above the ground if the value of h is 44 feet when $t = 0$.

MIXED REVIEW FOR TAKS

TAKS PRACTICE at classzone.com

REVIEW
Skills Review Handbook p. 993; TAKS Workbook

56. **TAKS PRACTICE** The cylindrical tube shown is metal. It has an inner radius of 10 inches, an outer radius of 12 inches, and a height of 23 inches. What is the approximate amount of metal needed to make this tube? *TAKS Obj. 8*



Ⓐ 289 in.^{3} Ⓑ 1012 in.^{3}

Ⓒ 3179 in.^{3} Ⓓ 4625 in.^{3}

REVIEW
Lesson 11.1; TAKS Workbook

57. **TAKS PRACTICE** Lisa records the price of regular gasoline every Friday for four months. Which measure of data describes the most frequent price of gasoline over the four month period? *TAKS Obj. 9*

Ⓕ Mean Ⓖ Median Ⓗ Mode Ⓙ Range

QUIZ *for Lessons 14.1–14.2*

Find the amplitude and the period of the graph of the function. *(p. 908)*

1. $y = \cos 4x$ **2.** $y = \frac{3}{2} \sin 5x$ **3.** $f(x) = \frac{1}{4} \sin x$

4. $y = \frac{1}{2} \cos 2\pi x$ **5.** $y = \sin \pi x$ **6.** $g(x) = 3 \cos \frac{\pi}{2}x$

Graph the function.

7. $y = 4 \sin \pi x$ *(p. 908)* **8.** $y = \frac{1}{2} \cos \frac{3}{2}\pi x$ *(p. 908)* **9.** $g(x) = 2 \tan \frac{1}{4}x$ *(p. 908)*

10. $f(x) = -2 \sin 3x + 4$ *(p. 915)* **11.** $y = \cos (x + \pi) + 2$ *(p. 915)* **12.** $y = -\tan 2\left(x + \frac{\pi}{2}\right)$ *(p. 915)*

13. **WINDOW WASHERS** You are standing 70 feet from the base of a 250 foot building watching a window washer lower himself to the ground. Write and graph a model that gives the window washer's distance d (in feet) from the top of the building as a function of the angle of elevation θ. *(p. 915)*