## ACTIVITY 31 PRACTICE
Write your answers on notebook paper.
**Show your work.**

Lesson 31-1

1. What is the approximate length of the arc formed by a 90° angle on a circle that has a radius of 70 feet?
   A. 55 ft   B. 110 ft
   C. 220 ft   D. 440 ft

2. A horse on a merry-go-round is positioned at a radius of 15 feet. How far will the horse travel after the merry-go-round rotates 60°?
   A. 15.7 ft   B. 23.6 ft
   C. 31.4 ft   D. 47.1 ft

3. A ticketholder is sitting on a bench that is on the merry-go-round. The ticketholder is sitting at a radius of 10 feet from the center. Approximately how far will the ticketholder travel after traveling 180° on the ride?

4. Several ticketholders are standing at various positions on the merry-go-round. Find the approximate distance ticketholders standing at the following radii will travel after the merry-go-round rotates 120°.
   a. 11 feet   b. 14 feet   c. 16 feet

5. Use the unit circle. What is the constant of proportionality for each of the following angles? Give your answer in terms of π.
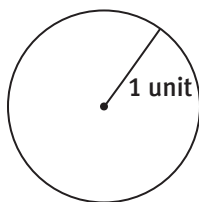
   a. 24°   b. 300°
   c. 72°   d. 270°

Find the arc lengths in Items 6 and 7.

6.

7.
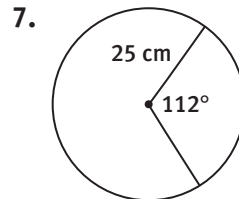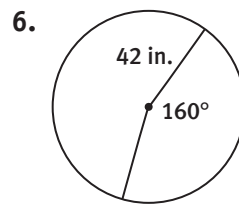
8. Find the length of the arc formed by each angle and the given radius.
   a. radius: 40 in., angle: 20°
   b. radius: 12 m, angle: 90°
   c. radius: 38 ft, angle: 75°

9. How many radians equal 225°?

10. Convert each degree measure to radians.
    a. 48°   b. 54°
    c. 160°   d. 120°

Lesson 31-2

11. Convert the following radian angle measures to degrees:

   a. $\frac{\pi}{10}$ b. $\frac{5\pi}{6}$

   c. $\frac{8\pi}{3}$ d. $\frac{7\pi}{4}$

   e. $\frac{11\pi}{9}$ f. $\frac{10\pi}{3}$

   g. $\frac{3\pi}{5}$ h. 4π

12. Is $\frac{\pi}{2}$ radians greater than, less than, or equal to 180°?

13. Is $\frac{3\pi}{4}$ radians greater than, less than, or equal to 180°?

14. Is $\frac{9\pi}{4}$ radians greater than, less than, or equal to 360°?

15. Is 2π radians greater than, less than, or equal to 360°?

16. A ticketholder on the merry-go-round is riding a horse that is at a radius of 12 feet. How far does she travel after the merry-go-round rotates $\frac{3\pi}{5}$ radians?

Use the following information for Items 17–20. A merry-go-round makes one complete rotation every 80 seconds.

17. Approximately how far will a ticketholder seated at a radius of 15 feet travel after 60 seconds?

18. Approximately how far will a ticketholder standing at a radius of 16 feet travel after 140 seconds?

19. Approximately how far will a ticketholder seated at a radius of 12 feet travel after 110 seconds?

MATHEMATICAL PRACTICES
Reason Abstractly and Quantitatively

20. A ticketholder seated at a radius of 14 feet rode the merry-go-round for 120 seconds. Find the distance the ticketholder traveled. What is the measure of the angle over which the ticketholder rotated in degrees? Explain how you found your answer.