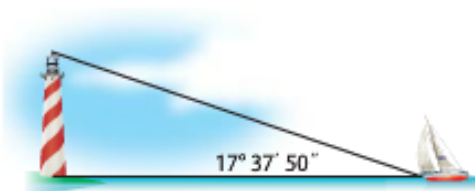


4.2 Assignment

Write each decimal degree measure in DMS form and each DMS measure in decimal degree form to the nearest thousandth. (Example 1)

- | | |
|------------------------|------------------------|
| 1. 11.773° | 2. 58.244° |
| 3. 141.549° | 4. 273.396° |
| 5. $87^\circ 53' 10''$ | 6. $126^\circ 6' 34''$ |
| 7. $45^\circ 21' 25''$ | 8. $301^\circ 42' 8''$ |

9. **NAVIGATION** A sailing enthusiast uses a sextant, an instrument that can measure the angle between two objects with a precision to the nearest 10 seconds, to measure the angle between his sailboat and a lighthouse. If his reading is $17^\circ 37' 50''$, what is the measure in decimal degree form to the nearest hundredth? (Example 1)



Write each degree measure in radians as a multiple of π and each radian measure in degrees. (Example 2)

- | | |
|----------------------|-----------------------|
| 10. 30° | 11. 225° |
| 12. -165° | 13. -45° |
| 14. $\frac{2\pi}{3}$ | 15. $\frac{5\pi}{2}$ |
| 16. $-\frac{\pi}{4}$ | 17. $-\frac{7\pi}{6}$ |

Identify all angles that are coterminal with the given angle. Then find and draw one positive and one negative angle coterminal with the given angle. (Example 3)

- | | |
|-----------------------|-----------------------|
| 18. 120° | 19. -75° |
| 20. 225° | 21. -150° |
| 22. $\frac{\pi}{3}$ | 23. $-\frac{3\pi}{4}$ |
| 24. $-\frac{\pi}{12}$ | 25. $\frac{3\pi}{2}$ |

Find the length of the intercepted arc with the given central angle measure in a circle with the given radius. Round to the nearest tenth. (Example 4)

27. $\frac{\pi}{6}$, $r = 2.5$ m

28. $\frac{2\pi}{3}$, $r = 3$ in.

29. $\frac{5\pi}{12}$, $r = 4$ yd

30. 105° , $r = 18.2$ cm

31. 45° , $r = 5$ mi

32. 150° , $r = 79$ mm

33 AMUSEMENT PARK A carousel at an amusement park rotates 3024° per ride. (Example 4)

- How far would a rider seated 13 feet from the center of the carousel travel during the ride?
- How much farther would a second rider seated 18 feet from the center of the carousel travel during the ride than the rider in part a?

Find the rotation in revolutions per minute given the angular speed and the radius given the linear speed and the rate of rotation. (Example 5)

34. $\omega = \frac{2}{3}\pi$ rad/s

35. $\omega = 135\pi$ rad/h

36. $\omega = 104\pi$ rad/min

37. $v = 82.3$ m/s, 131 rev/min

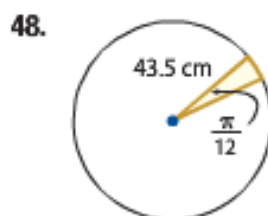
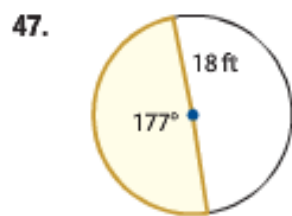
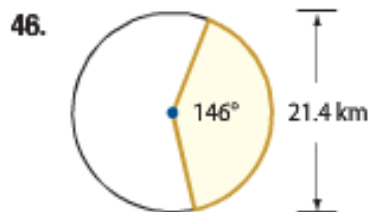
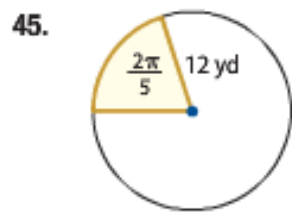
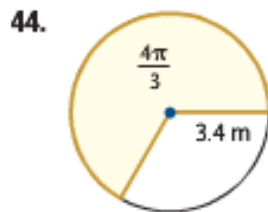
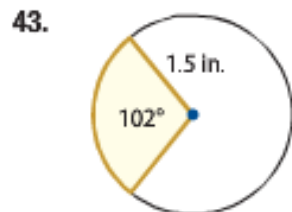
38. $v = 144.2$ ft/min, 10.9 rev/min

39. $v = 553$ in./h, 0.09 rev/min

41. **CARS** On a stretch of interstate, a vehicle's tires range between 646 and 840 revolutions per minute. The diameter of each tire is 26 inches. (Example 5)

- Find the range of values for the angular speeds of the tires in radians per minute.
- Find the range of values for the linear speeds of the tires in miles per hour.

GEOMETRY Find the area of each sector. (Example 6)



49. **GAMES** The dart board shown is divided into twenty equal sectors. If the diameter of the board is 18 inches, what area of the board does each sector cover? (Example 6)



The area of a sector of a circle and the measure of its central angle are given. Find the radius of the circle.

51. $A = 29 \text{ ft}^2, \theta = 68^\circ$ 52. $A = 808 \text{ cm}^2, \theta = 210^\circ$
 53. $A = 377 \text{ in}^2, \theta = \frac{5\pi}{3}$ 54. $A = 75 \text{ m}^2, \theta = \frac{3\pi}{4}$

55. Describe the radian measure between 0 and 2π of an angle θ that is in standard position with a terminal side that lies in:

- a. Quadrant I c. Quadrant III
 b. Quadrant II d. Quadrant IV

57. **GEOGRAPHY** Phoenix, Arizona, and Ogden, Utah, are located on the same line of longitude, which means that Ogden is directly north of Phoenix. The latitude of Phoenix is $33^\circ 26' \text{ N}$, and the latitude of Ogden is $41^\circ 12' \text{ N}$. If Earth's radius is approximately 3963 miles, about how far apart are the two cities?



Find the measure of angle θ in radians and degrees.

