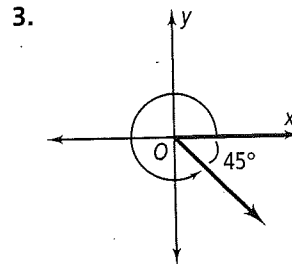
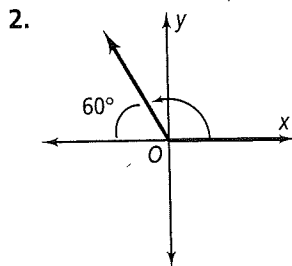
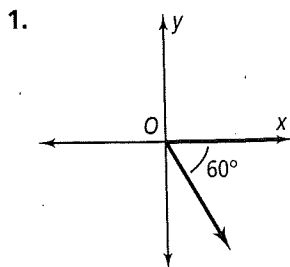


13-2 Practice

Angles and the Unit Circle

Form G

Find the measure of each angle in standard position.



Sketch each angle in standard position.

4. 100°

5. 210°

6. -45°

7. -90°

8. -330°

9. -180°

10. -145°

11. 60°

Find the measure of an angle between 0° and 360° coterminal with each given angle.

12. -100°

13. -60°

14. -225°

15. -145°

16. 372°

17. -15°

18. 482°

19. 484°

20. -20°

21. 421°

22. 409°

23. -38°

24. 376°

25. -210°

26. 387°

27. 390°

28. 660°

29. 440°

30. -170°

31. 370°

32. -700°

33. 458°

34. 480°

35. 406°

36. -120°

37. 460°

38. -222°

39. -330°

40. -127°

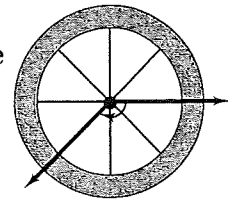
41. 377°

13-2 Practice (continued)

Angles and the Unit Circle

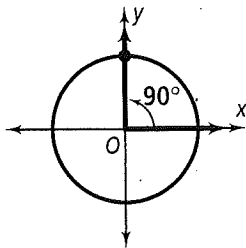
Form G

42. The spokes shown on the bicycle wheel at the right form an angle. Estimate the measures of two coterminal angles that coincide with the angle at the right.

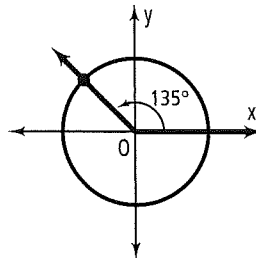


Find the exact values of the cosine and sine of each angle. Then find the decimal values. Round your answers to the nearest hundredth.

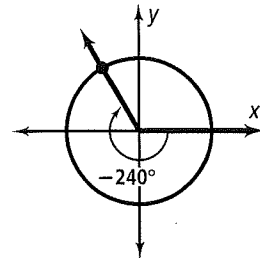
43.



44.



45.



46. 45°

47. -150°

48. 720°

Graphing Calculator For each angle θ , find the values of $\cos \theta$ and $\sin \theta$. Round your answers to the nearest hundredth.

49. 225°

50. -225°

51. -45°

52. 330°

53. -330°

54. 150°

Open-Ended Find a positive and a negative coterminal angle for the given angle.

55. 50°

56. -130°

57. -680°

58. 395°

59. -38°

60. -434°

61. a. Suppose you know the terminal side of angle θ lies in Quadrant II. What is the sign of $\cos \theta$? $\sin \theta$?
 b. **Writing** Describe the reasoning you followed to answer part (a).

13-3 Practice

Form G

Radian Measure

Write each measure in radians. Express your answer in terms of π and as a decimal rounded to the nearest hundredth.

- | | | | |
|----------------|-----------------|----------------|-----------------|
| 1. 45° | 2. 90° | 3. 30° | 4. -150° |
| 5. 180° | 6. -240° | 7. 270° | 8. 300° |

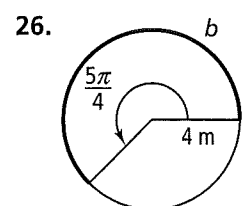
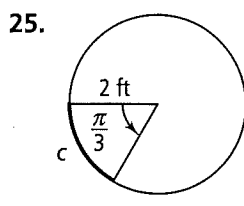
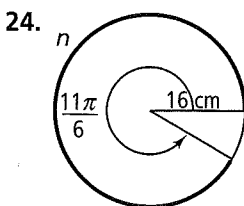
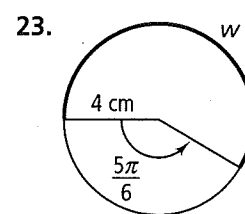
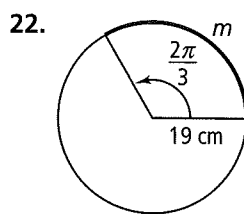
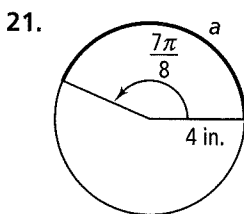
Write each measure in degrees. Round your answer to the nearest degree, if necessary.

- | | | |
|----------------------------|-------------------------------|------------------------------|
| 9. $\frac{\pi}{6}$ radians | 10. $-\frac{7\pi}{6}$ radians | 11. $\frac{7\pi}{4}$ radians |
| 12. -4 radians | 13. 1.8 radians | 14. 0.45 radians |

The measure θ of an angle in standard position is given. Find the exact values of $\cos \theta$ and $\sin \theta$ for each angle measure.

- | | | |
|----------------------|-----------------------|-----------------------|
| 15. $\frac{\pi}{6}$ | 16. $\frac{\pi}{3}$ | 17. $-\frac{3\pi}{4}$ |
| 18. $\frac{7\pi}{4}$ | 19. $\frac{11\pi}{6}$ | 20. $-\frac{2\pi}{3}$ |

Use each circle to find the length of the indicated arc. Round your answer to the nearest tenth.



13-3 Practice (continued)

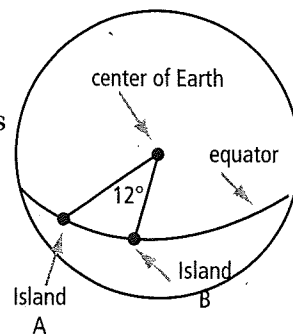
Radian Measure

Form G

27. The minute hand of a clock is 8 in. long.
- What distance does the tip of the minute hand travel in 10 min?
 - What distance does the tip of the minute hand travel in 40.5 min?
 - What distance does the tip of the minute hand travel in 3.25 h?
 - Reasoning** After approximately how many hours has the tip of the minute hand traveled 100 ft?

28. A 0.8 m pendulum swings through an angle of 86° . What distance does the tip of the pendulum travel?

29. A scientist studies two islands shown at the right. The distance from the center of the Earth to the equator is about 3960 mi.
- What is the measure in radians of the central angle that intercepts the arc along the equator between the islands?
 - About how far apart are the two islands?



Determine the quadrant or axis where the terminal side of each angle lies.

30. $\frac{\pi}{5}$ 31. $-\frac{5\pi}{2}$ 32. $\frac{5\pi}{3}$ 33. $\frac{8\pi}{7}$

Draw an angle in standard position with each given measure. Then find the values of the cosine and sine of the angle.

34. $\frac{5\pi}{4}$ 35. -3π 36. $\frac{2\pi}{9}$

37. **Error Analysis** A student wanted to convert 75° to radians. His calculation is shown at the right. What error did he make? What is the correct conversion?
- $$\frac{(75 \times 180)}{\pi} \approx 4297.18 \text{ radians}$$