Answers for Lesson 13-3 Exercises

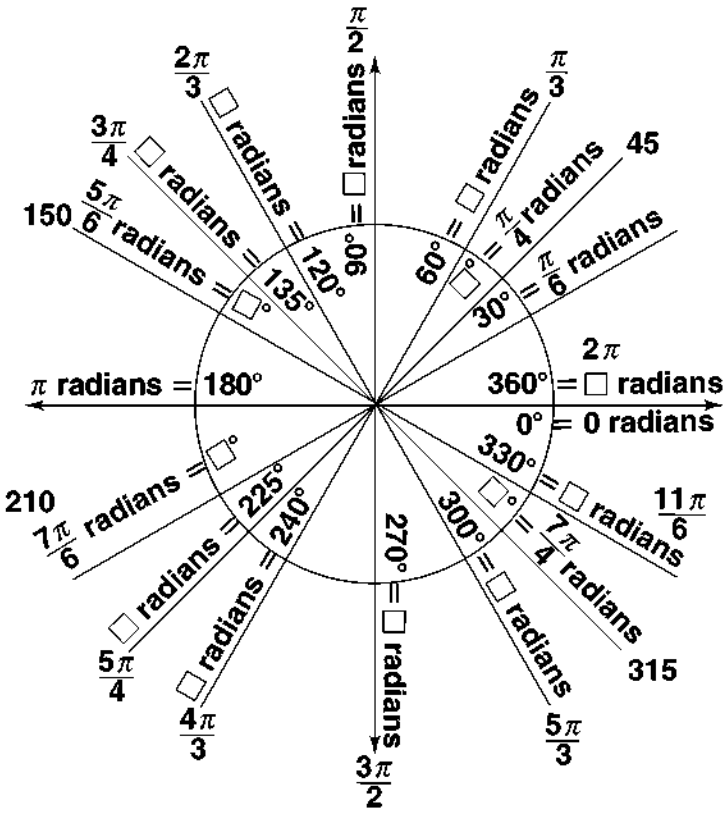
1. $-\frac{5\pi}{3}, -5.24$ **2.** $\frac{5\pi}{6}, 2.62$ **3.** $-\frac{\pi}{2}, -1.57$

4. $-\frac{\pi}{3}, -1.05$ **5.** $\frac{8\pi}{9}, 2.79$ **6.** $\frac{\pi}{9}, 0.35$

7. 540° **8.** 198° **9.** -120°

10. -172° **11.** 90° **12.** 270°

13.



14. $\frac{\sqrt{3}}{2}, \frac{1}{2}$ **15.** $\frac{1}{2}, \frac{\sqrt{3}}{2}$ **16.** 0,1

17. $-\frac{1}{2}, \frac{\sqrt{3}}{2}$ **18.** $-\frac{\sqrt{3}}{2}, \frac{1}{2}$ **19.** $0, -1$

20. 3.1 cm **21.** 10.5 m **22.** 51.8 ft

23. 25.1 in. **24.** 4.7 m **25.** 43.2 cm

26. ≈ 107 in. **27.** ≈ 32 ft

28. a. ≈11,048 km

b. ≈33,144 km

c. ≈27,620 km

d. ≈276,198 km

e. 18.1 h

29. ≈42.2 in.

30. a. 15°, $\frac{\pi}{12}$ radians

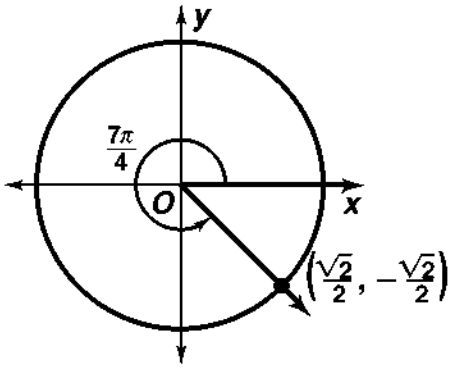
b. ≈1036.7 mi

c. ≈413.6 mi

31. III **32.** II **33.** positive *y*-axis

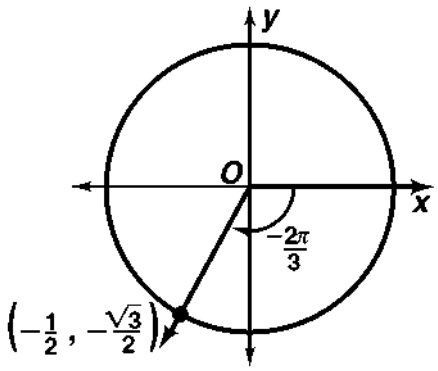
34. II **35.** negative *x*-axis **36.** III

37.



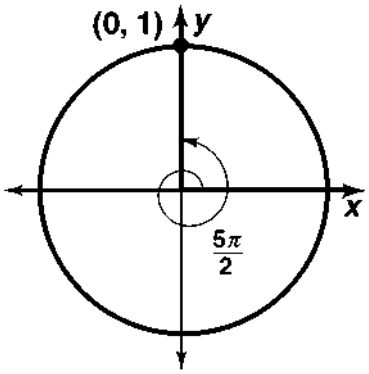
0.71, −-0.71

38.



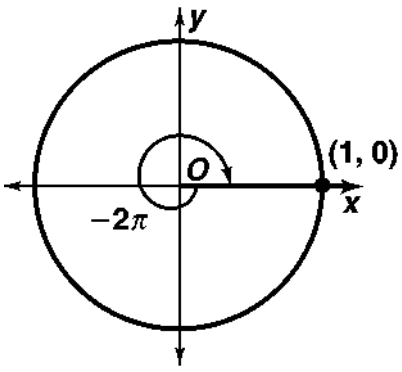
−-0.50, −-0.87

39.



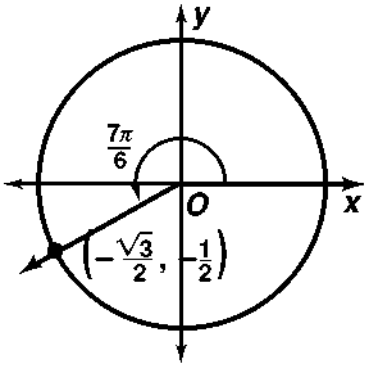
0.00,1.00

40.



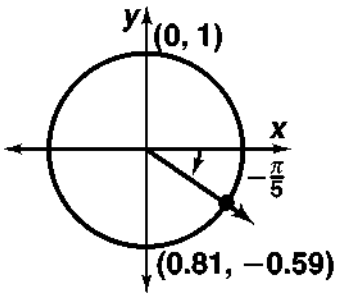
1.00,0.00

41.



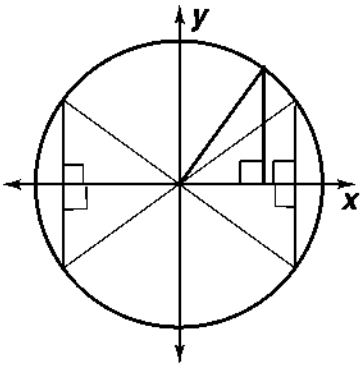
−-0.87, −-0.50

42.



0.81,−-0.59

43. a-b.



c. All five triangles are congruent by SSS. All have a hypotenuse of 1 unit, a long leg of about 0.81 unit, and a short leg of 0.59 unit.

$\cos \frac{\pi}{5} \approx 0.81$, $\sin \frac{\pi}{5} \approx 0.59$;

$\sin \frac{3\pi}{10} \approx 0.81$, $\cos \frac{3\pi}{10} \approx 0.59$;

$\cos \frac{4\pi}{5} \approx$ -0.81, $\sin \frac{4\pi}{5} \approx 0.59$;

$\cos \frac{6\pi}{5} \approx$ -0.81, $\sin \frac{6\pi}{5} \approx$ −-0.59;

$\cos \frac{9\pi}{5} \approx 0.81$, $\sin \frac{9\pi}{5} \approx$ -0.59

44. Check students' work.

45. ≈11 radians

46. The student forgot to include parentheses around 2*π.

47. ≈798 ft; 55°, -665°

48. ≈23.6 in.; Sample: $-\frac{7\pi}{6}, \frac{17\pi}{6}$

49. If two angles measured in radians are coterminal, the difference of their measures will be evenly divisible by 2π.

50. ≈6.3 cm

51. ≈4008.7 mi

52. $-\frac{3\pi}{2}$ radians

53. $-\frac{11\pi}{3}$ radians

54. $\frac{4\pi}{3}$ radians

55. $\frac{35\pi}{6}$ radians

56.

$$\begin{aligned} \frac{\theta}{2\pi} &= \frac{s}{2\pi r} \\ \frac{\theta}{2\pi} \cdot 2\pi r &= \frac{s}{2\pi r} \cdot 2\pi r \\ \theta r &= s \\ s &= r\theta \end{aligned}$$

57. a. 0.5017962; 0.4999646; the first four terms

b. $1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \ldots$

c. ≈0.951; 18°