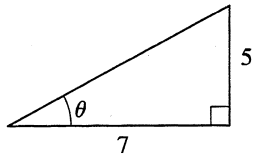
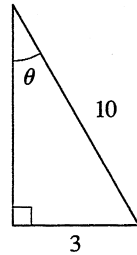


13–14 ■ Find the values of the six trigonometric ratios of θ .

13.

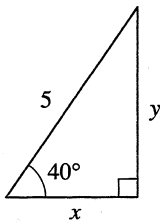


14.

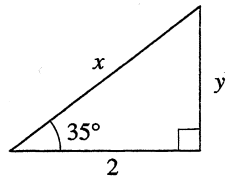


15–18 ■ Find the sides labeled x and y , correct to two decimal places.

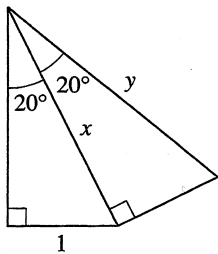
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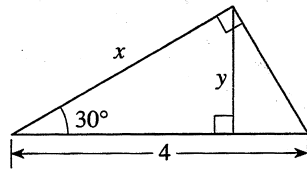
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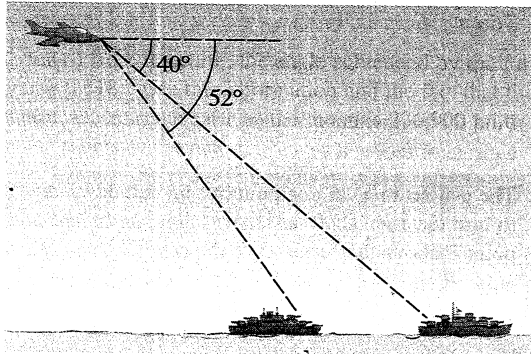
17.



18.



26. A pilot measures the angles of depression to two ships to be 40° and 52° (see the figure). If the pilot is flying at an elevation of 35,000 ft, find the distance between the two ships.



CHAPTER 7 REVIEW

27–38 ■ Find the exact value.

27. $\sin 315^\circ$

28. $\csc \frac{9\pi}{4}$

29. $\tan(-135^\circ)$

30. $\cos \frac{5\pi}{6}$

31. $\cot\left(-\frac{22\pi}{3}\right)$

32. $\sin 405^\circ$

33. $\cos 585^\circ$

34. $\sec \frac{22\pi}{3}$

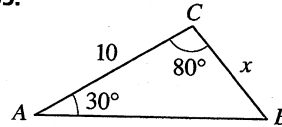
35. $\csc \frac{8\pi}{3}$

36. $\sec \frac{13\pi}{6}$

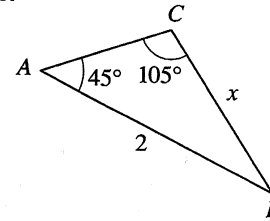
37. $\cot(-390^\circ)$

38. $\tan \frac{23\pi}{4}$

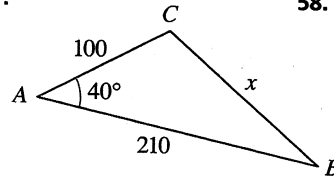
55.



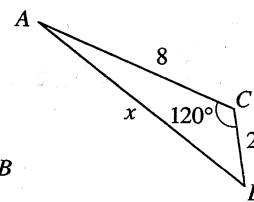
56.



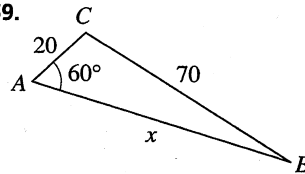
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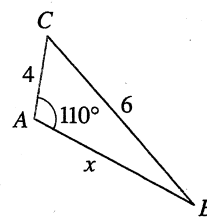
58.



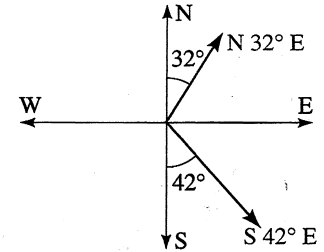
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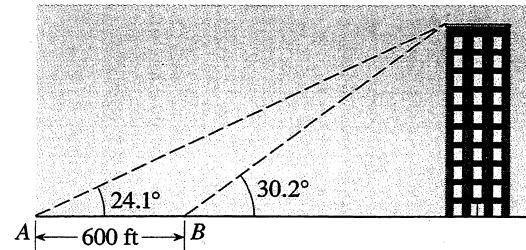
60.



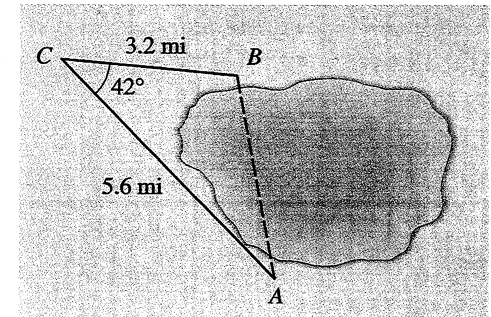
61. Two ships leave a port at the same time. One travels at 20 mi/h in a direction $N 32^\circ E$, and the other travels at 28 mi/h in a direction $S 42^\circ E$ (see the figure). How far apart are the two ships after 2 h?



62. From a point A on the ground, the angle of elevation to the top of a tall building is 24.1° . From a point B , which is 600 ft closer to the building, the angle of elevation is measured to be 30.2° . Find the height of the building.



63. Find the distance between points A and B on opposite sides of a lake from the information shown.



29–36 ■ (a) Find the amplitude, period, and phase shift of the function, and (b) sketch the graph.

29. $y = 10 \cos \frac{1}{2}x$

30. $y = 4 \sin 2\pi x$

31. $y = -\sin \frac{1}{2}x$

32. $y = 2 \sin\left(x - \frac{\pi}{4}\right)$

33. $y = 3 \sin(2x - 2)$

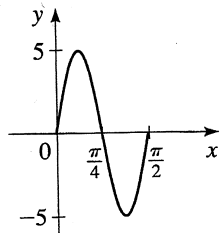
34. $y = \cos 2\left(x - \frac{\pi}{2}\right)$

35. $y = -\cos\left(\frac{\pi}{2}x + \frac{\pi}{6}\right)$

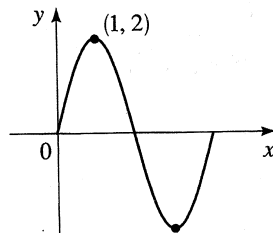
36. $y = 10 \sin\left(2x - \frac{\pi}{2}\right)$

37–40 ■ The graph of one period of a function of the form $y = a \sin k(x - b)$ or $y = a \cos k(x - b)$ is shown. Determine the function.

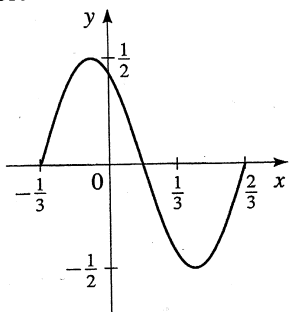
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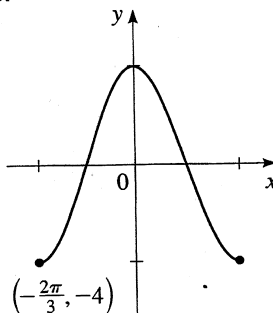
38.



39.



40.



41–48 ■ Find the period, and sketch the graph.

41. $y = 3 \tan x$

42. $y = \tan \pi x$

43. $y = 2 \cot\left(x - \frac{\pi}{2}\right)$

44. $y = \sec\left(\frac{1}{2}x - \frac{\pi}{2}\right)$

45. $y = 4 \csc(2x - \pi)$

46. $y = \tan\left(x + \frac{\pi}{6}\right)$

47. $y = \tan\left(\frac{1}{2}x - \frac{\pi}{8}\right)$

48. $y = -4 \sec 4\pi x$

1–22 ■ Verify the identity.

1. $\cos^2 x \csc x - \csc x = -\sin x$

2. $\frac{1}{1 - \sin^2 x} = 1 + \tan^2 x$

3. $\frac{\cos^2 x - \tan^2 x}{\sin^2 x} = \cot^2 x - \sec^2 x$

4. $\frac{1 + \sec x}{\sec x} = \frac{\sin^2 x}{1 - \cos x}$

5. $\frac{\cos^2 x}{1 - \sin x} = \frac{\cos x}{\sec x - \tan x}$

6. $(1 - \tan x)(1 - \cot x) = 2 - \sec x \csc x$

7. $\sin^2 x \cot^2 x + \cos^2 x \tan^2 x = 1$

8. $(\tan x + \cot x)^2 = \csc^2 x \sec^2 x$

9. $\frac{\sin 2x}{1 + \cos 2x} = \tan x$

10. $\frac{\cos(x + y)}{\cos x \sin y} = \cot y - \tan x$

11. $\tan \frac{x}{2} = \csc x - \cot x$

12. $\frac{\sin(x + y) + \sin(x - y)}{\cos(x + y) + \cos(x - y)} = \tan x$

55–60 ■ Find the exact value of the expression given that $\csc x = \frac{3}{2}$, $\csc y = 3$, and x and y are in quadrant I.

55. $\sin(x + y)$

56. $\cos(x - y)$

57. $\tan(x + y)$

58. $\sin 2x$

59. $\cos \frac{y}{2}$

60. $\tan \frac{y}{2}$