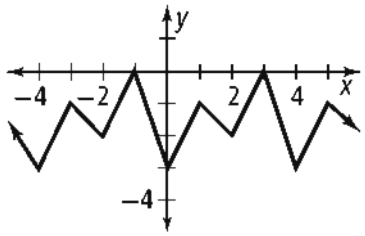
Math 3 Trigonometry — Extra Practice

Lesson 13-1

Find the period and amplitude of each periodic function.

1.



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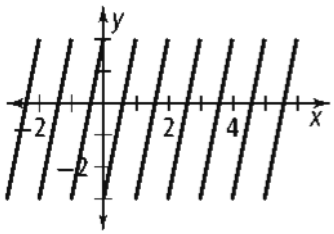

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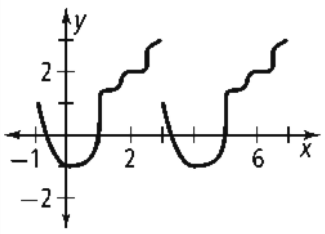
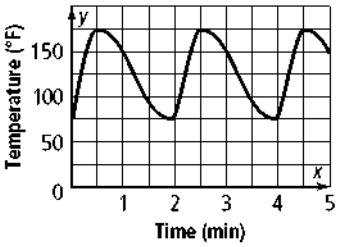


4. The graph at the right shows the temperature changes of a heating coil. Use the amplitude and the period.



5. Describe four real-world situations that involve periodic changes. Explain h amplitude and the period in each case.

Lesson 13-2

Sketch each angle in standard position.

6. 15°

7. −230°

8. 400°

9. −145°

10. 280°

11. −750°

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

12. −70°

13. −480°

14. 849°

Find the exact values of the cosine and sine of each angle.

15. 30°

16. 750°

17. 5π

Lesson 13-3

Write each measure in radians.

18. 100°

19. 270°

20. −45°

21. −550°

22. 425°

23. 10°

Write each measure in degrees. When necessary, round your answer to the nearest degree.

24. 5π radians

25. −2 radians

26. $\frac{5\pi}{6}$ radians

27. -3π radians

28. $-\frac{13\pi}{10}$ radians

29. 9 radians

30. Name two different times when the hands of a clock show each angle.

a. $\frac{\pi}{3}$ radians

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

31. a. How much time passes as the minute hand of a clock sweeps $\frac{\pi}{4}$ radians?

b. How much time passes as the hour hand sweeps $\frac{\pi}{4}$ radians?

c. The hour hand of a clock is 3 in. long. What distance does the tip of the hour hand travel in 3.5 h? Round to the nearest tenth of an inch.

Lessons 13-4 through 13-6

Identify the amplitude or asymptotes, and the period for each function.

32. $y = 4 \sin 3x$

33. $y = \cos 4x$

34. $y = \frac{1}{3}\tan \pi x$

35. $y = 2\cos\frac{x}{4}$

36. $y = 3 \tan x$

37. $y = \frac{1}{9}\sin 5x$

Sketch the graph of one cycle of each function.

38. $y = 2 \cos x$

39. $y = 3 \sin 2x$

40. $y = \tan\frac{x}{2}$

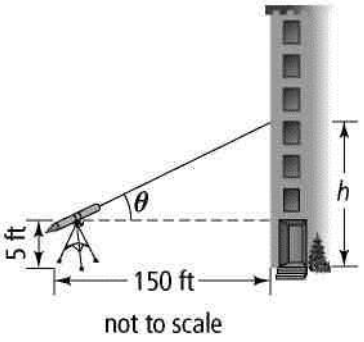
41. $y = -\sin 3x$

42. $y = \cos 4x$

43. $y = -2 \tan \pi x$

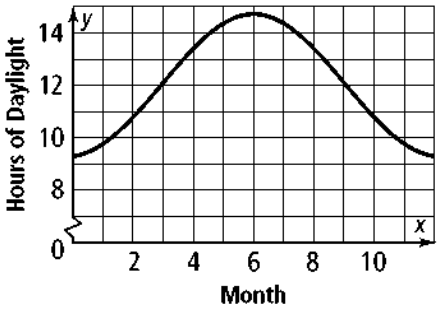
44. Earthquakes under the ocean can sometimes cause a dangerous wave called a tsunami. You can model the motion of a tsunami with the function $f(x) = a \cos bx$. Write an equation that models a tsunami that travels at 120 ft/s, has a period of 20 s, and has an amplitude of 60 ft.

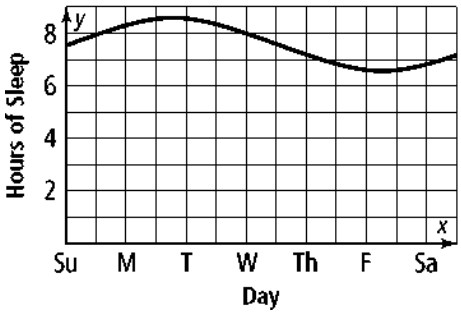
45. Owen is using a telescope to measure a tall building down the street. Thro the point on the building that is h ft above ground. The relationship between the can be modeled by $h = 150 \tan \theta + 5$. Owen changed the angle θ from 70° to the building that he can see now?



not to scale

46. The graph at the right models the number of hours of daylight at a latitude of 40°N for a one-year period. The y-intercept is about 9.3 and the maximum is about 14.7. Each whole number on the x-axis corresponds to the beginning of a month (0 for January, 1 for February, and so on). Write an equation for the curve.





47. The graph at the left approximates the number of hours of sleep that Kent gets each day in an average week. He usually gets at least 6.5 hours but no more than 8.5 hours of sleep on any given day. Write an equation that describes the graph.

Lesson 13-8

Evaluate each expression. If not found on the unit circle, round your answer to the nearest thousandth.

48. cot 1

49. sec 4

50. csc (−0.8)

51. sec $(-\pi)$

52. $\cot \frac{3\pi}{2}$

53. $\csc \frac{\pi}{4}$

54. sec 1.1

55. cot 2

56. csc 2.5