

Answers for Lesson 13-4 Exercises

1. $\frac{1}{2}$

2. ≈ 0.7

3.

≈ 0.9

4. 0

5. ≈ -0.9

6. ≈ -0.9

7. 1

8. ≈ 0.1

9. ≈ -0.8

10. ≈ -1

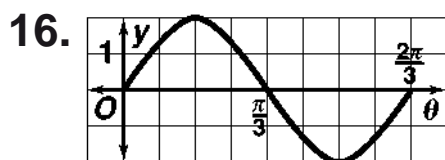
11. -1

12. ≈ -0.7

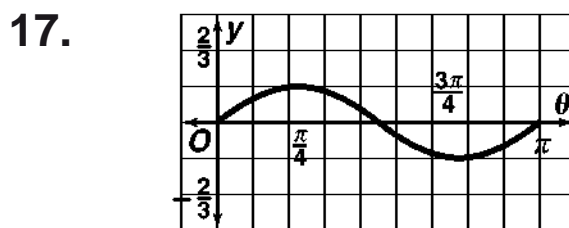
13. 3; $2, \frac{2\pi}{3}$

14. $\frac{1}{2}$; $1, 4\pi$

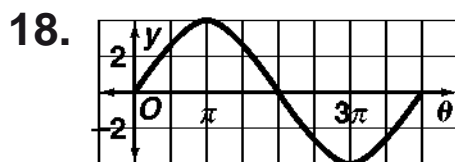
15. 2; 3, π



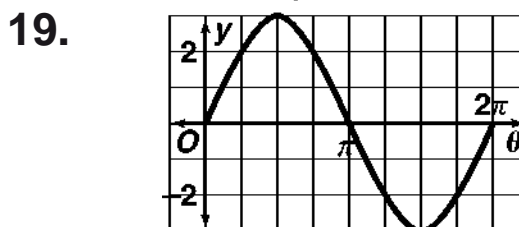
$y = 2 \sin 3\theta$



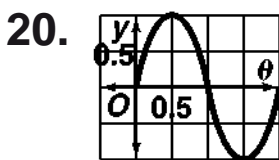
$y = \frac{1}{3} \sin 2\theta$



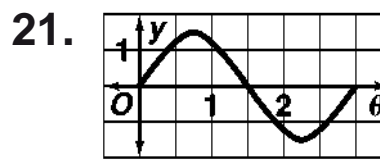
$y = 4 \sin \frac{1}{2} \theta$



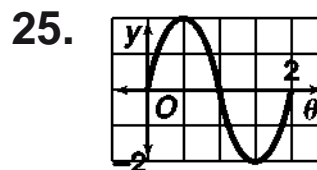
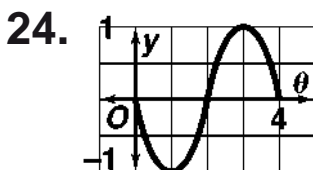
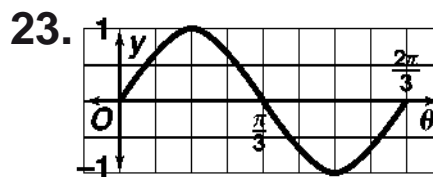
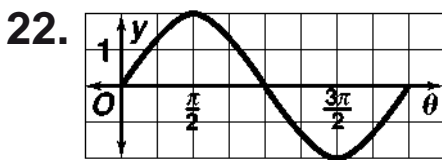
$y = 3 \sin \theta$



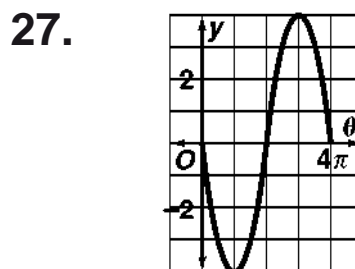
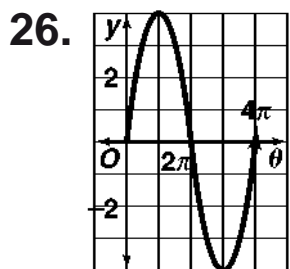
$y = \sin \pi\theta$



$y = 1.5 \sin \frac{2\pi}{3} \theta$



Answers for Lesson 13-4 Exercises (cont.)



28. 2π ; $y = 2 \sin \theta$

29. 2π ; $y = -3 \sin \theta$

30. π ; $y = \frac{5}{2} \sin 2\theta$

31. $\frac{\pi}{3}$; $y = \frac{1}{2} \sin 6\theta$

32. π ; $y = -\sin 2\theta$

33. 4 ; $y = 3 \sin \frac{\pi}{2}\theta$

34. 1 ; $1, 2\pi$

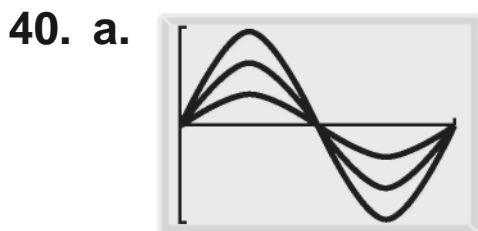
35. 5 ; $1, \frac{2\pi}{5}$

36. π ; $1, 2$

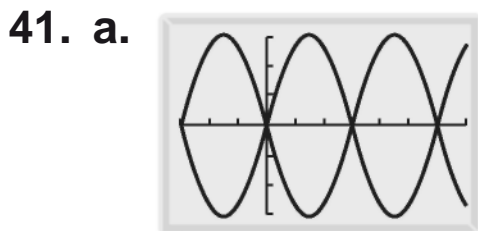
37. 1 ; $3, 2\pi$

38. 1 ; $5, 2\pi$

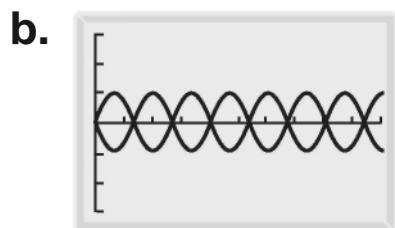
39. 2π ; $5, 1$



b. As a increases, the amplitude of the graph increases.



They are reflections of each other in the x -axis.



They are reflections of each other in the x -axis.

c. When either a or b is replaced by its opposite, the graph is a reflection of the original graph in the x -axis.

Answers for Lesson 13-4 Exercises (cont.)

42. a. π

b. 4

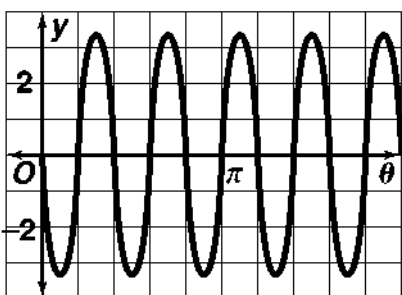
43. a. $\frac{1}{440}$

b. 0.001

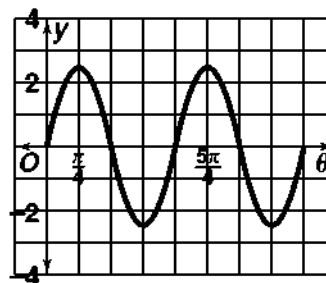
c. 880π

44. • $|a|$ is the amplitude of the function.
- b is the number of cycles in the interval 0 to 360 .
 - $\frac{360^\circ}{b}$ is the period of the function. The properties relating to number of cycles and period are affected.

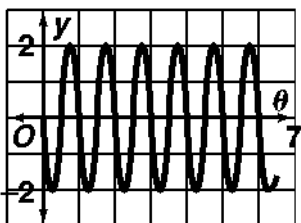
45. $\frac{2\pi}{5}, 3.5$



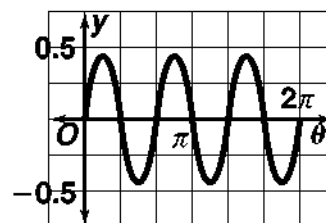
46. $\pi, \frac{5}{2}$



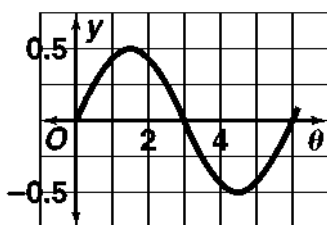
47. 1, 2



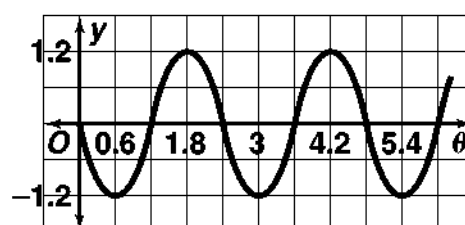
48. $\frac{2\pi}{3}, 0.4$



49. 6, 0.5



50. $\frac{12}{5}, 1.2$



51. Check students' work.

Answers for Lesson 13-4 Exercises (cont.)

52. a. $4, 2\pi$

b. $y = 4 \sin \theta$

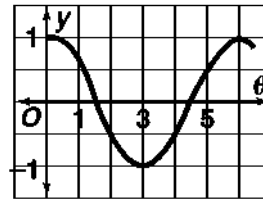
c. coil B

53. $y = \sin 60\pi$

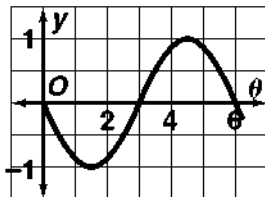
54. $y = \sin 30\pi\theta$

55. $y = \sin 240,000\pi\theta$

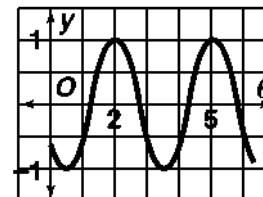
56. $2\pi, 1$



57. $2\pi, 1$



58. $\pi, 1$



59. a. days from spring equinox, hours of sunlight

b. $\frac{23}{12}$ h, about 365 days

c. $y = \frac{23}{12} \sin \frac{2\pi x}{365}$

d. 1.1 h

e. Check students' work.