

6.6 EXERCISES

In Problems 1–10, determine the amplitude and period of each function without graphing.

1. $y = 2 \sin x$

2. $y = 3 \cos x$

3. $y = -4 \cos(2x)$

4. $y = -\sin(\frac{1}{2}x)$

5. $y = 6 \sin(\pi x)$

6. $y = -3 \cos(3x)$

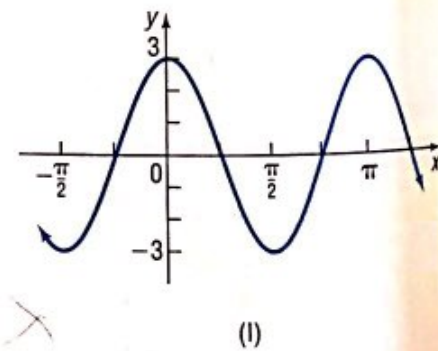
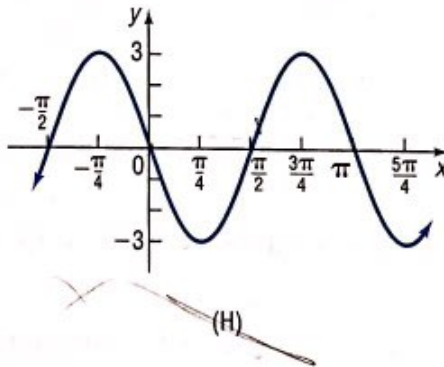
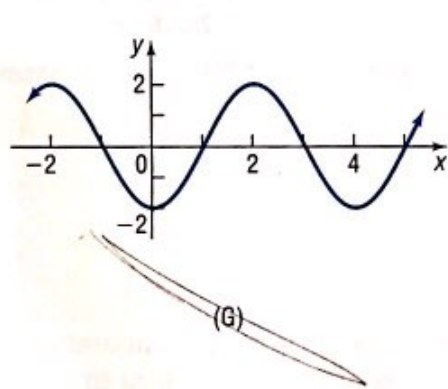
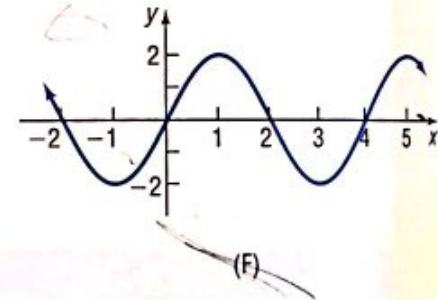
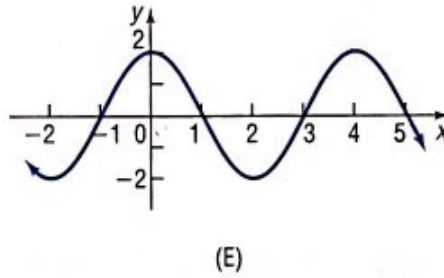
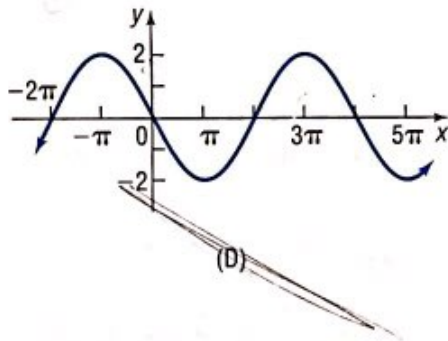
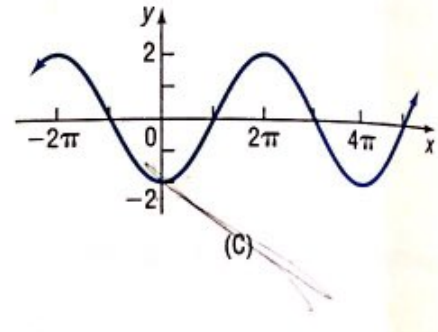
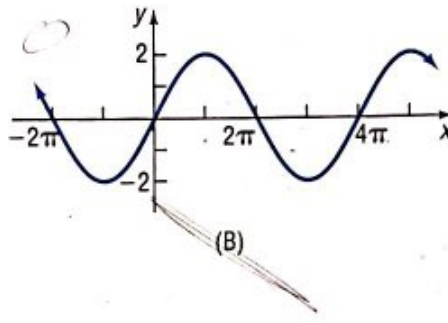
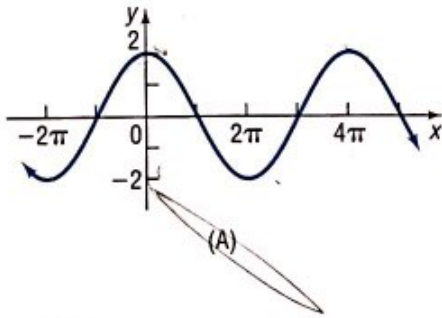
7. $y = -\frac{1}{2} \cos(\frac{3}{2}x)$

8. $y = \frac{4}{3} \sin(\frac{2}{3}x)$

9. $y = \frac{5}{3} \sin(-\frac{2\pi}{3}x)$

10. $y = \frac{9}{5} \cos(-\frac{3\pi}{2}x)$

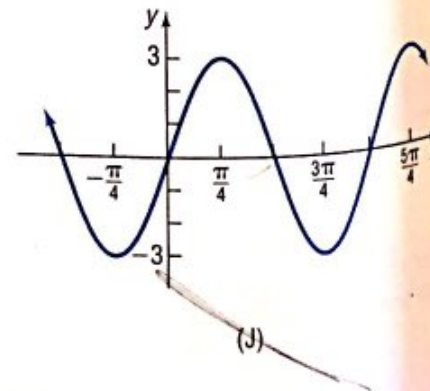
In Problems 11–20, match the given function to one of the graphs (A)–(J). Do not use a graphing utility.



11. $y = 2 \sin(\frac{\pi}{2}x)$

12. $y = 2 \cos(\frac{\pi}{2}x)$

13. $y = 2 \cos(\frac{1}{2}x)$



14. $y = 3 \cos(2x)$

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

16. $y = 2 \sin(\frac{1}{2}x)$

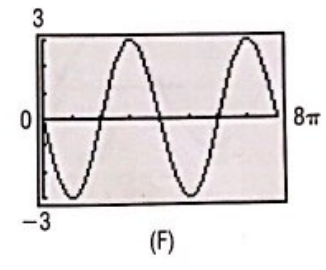
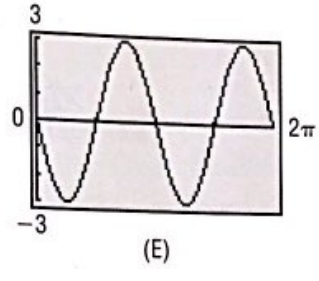
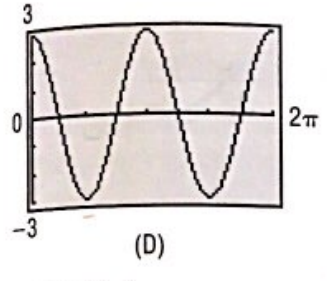
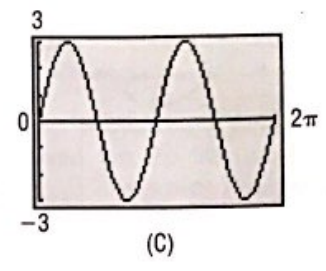
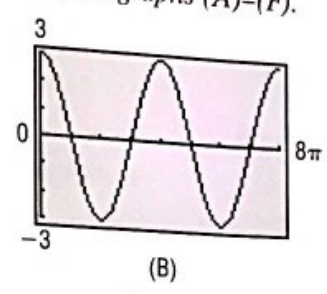
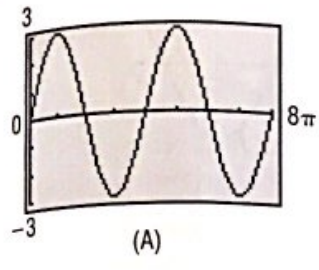
17. $y = -2 \cos(\frac{1}{2}x)$

18. $y = -2 \cos(\frac{\pi}{2}x)$

19. $y = 3 \sin(2x)$

20. $y = -2 \sin(\frac{1}{2}x)$

In Problems 21–26, match the given function to one of the graphs (A)–(F).



- 21. $y = 3 \sin(\frac{1}{2}x)$
- 24. $y = 3 \sin(2x)$

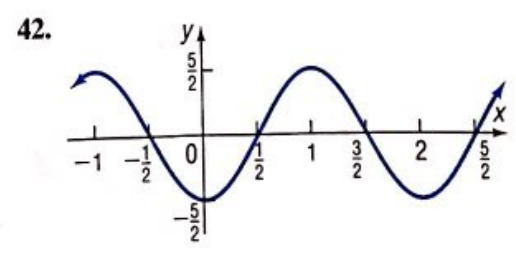
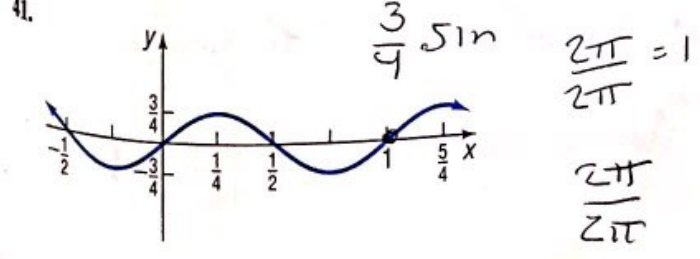
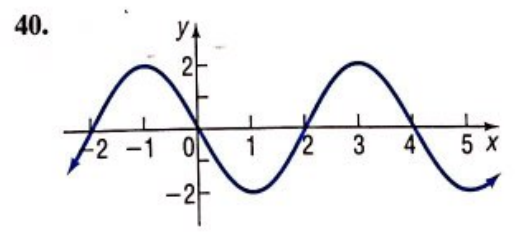
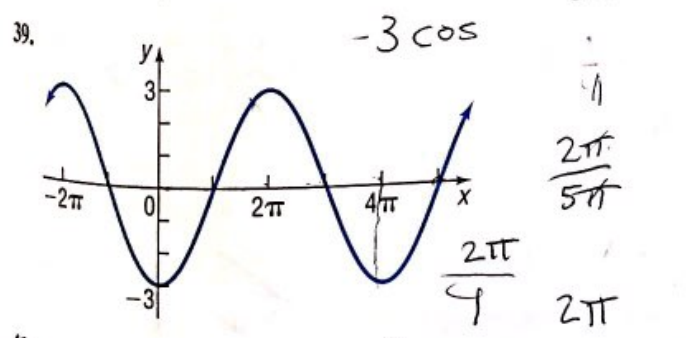
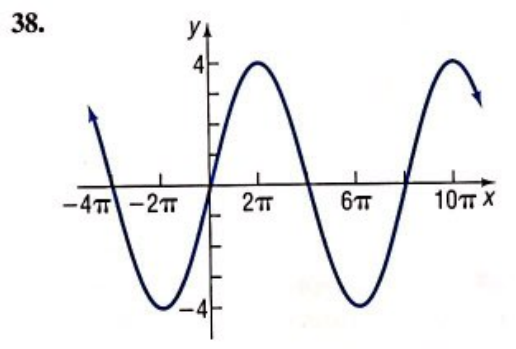
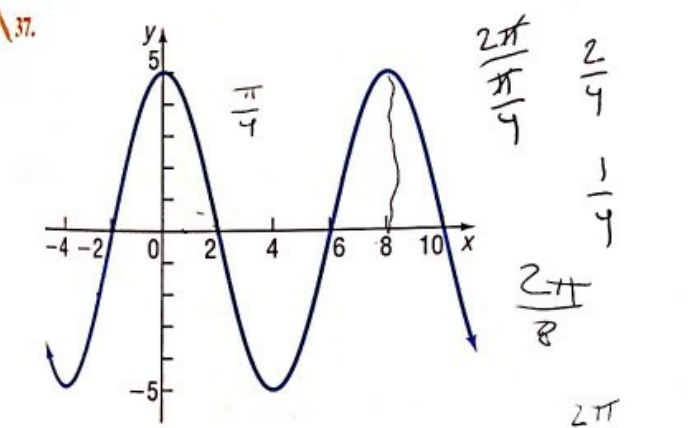
- 22. $y = -3 \sin(2x)$
- 25. $y = 3 \cos(\frac{1}{2}x)$

- 23. $y = 3 \cos(2x)$
- 26. $y = -3 \sin(\frac{1}{2}x)$

In Problems 27–36, graph each function by hand. Verify the result using a graphing utility.

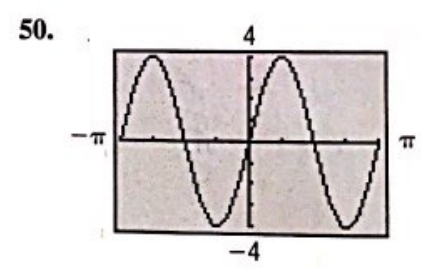
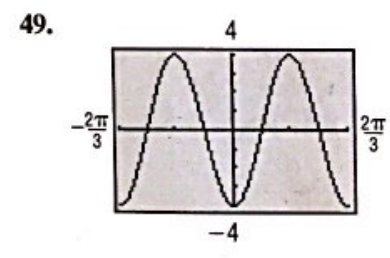
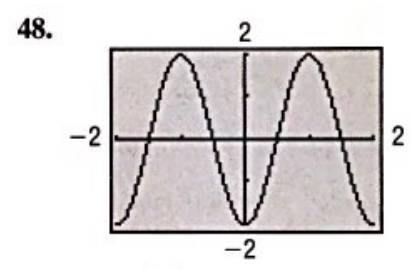
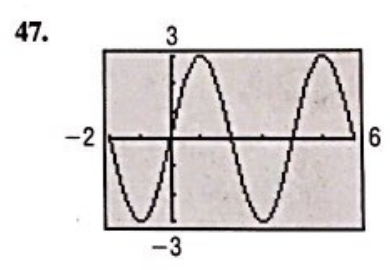
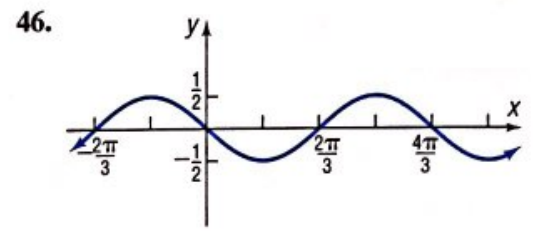
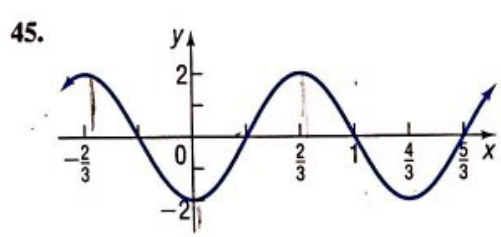
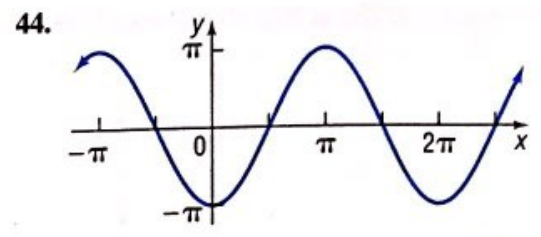
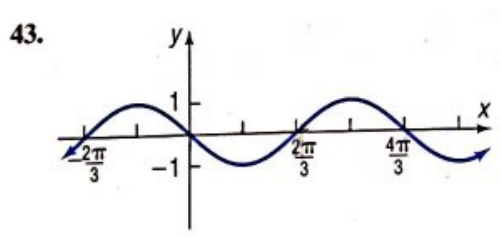
- 27. $y = 5 \sin(4x)$
- 28. $y = 4 \cos(6x)$
- 29. $y = 5 \cos(\pi x)$
- 30. $y = 2 \sin(\pi x)$
- 31. $y = -2 \cos(2\pi x)$
- 32. $y = -5 \cos(2\pi x)$
- 33. $y = -4 \sin(\frac{1}{2}x)$
- 34. $y = -2 \cos(\frac{1}{2}x)$
- 35. $y = \frac{3}{2} \sin(-\frac{2}{3}x)$
- 36. $y = \frac{4}{3} \cos(-\frac{1}{3}x)$

In Problems 37–50, find an equation for each graph.



72 + 393 # 1-23 odd + 43-51 odd

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In Problems 51–62, find the amplitude, period, and phase shift of each function. Graph the function by hand and show at least one period. Verify your results using a graphing utility.

- 51. $y = 4 \sin(2x - \pi)$
- 52. $y = 3 \sin(3x - \pi)$
- 53. $y = 2 \cos(3x + \frac{\pi}{2})$
- 54. $y = 3 \cos(2x + \pi)$
- 55. $y = -3 \sin(2x + \frac{\pi}{2})$
- 56. $y = -2 \cos(2x - \frac{\pi}{2})$
- 57. $y = 4 \sin(\pi x + 2)$
- 58. $y = 2 \cos(2\pi x + 4)$
- 59. $y = 3 \cos(\pi x - 2) + 1$
- 60. $y = 2 \cos(2\pi x - 4) - 3$
- 61. $y = 3 \sin(-2x + \frac{\pi}{2}) - 2$
- 62. $y = 3 \cos(-2x + \frac{\pi}{2}) + 5$

In Problems 63–70, write the equation of a sine function that has the given characteristics.

- 63. Amplitude: 3
Period: π
- 64. Amplitude: 2
Period: 4π
- 65. Amplitude: 3
Period: 2
- 66. Amplitude: 4
Period: 1
- 67. Amplitude: 2
Period: π
Phase shift: $\frac{1}{2}$
- 68. Amplitude: 3
Period: $\pi/2$
Phase shift: 2
- 69. Amplitude: 3
Period: 3π
Phase shift: ...
- 70. Amplitude: 2
Period: π