Extra Practice 13.7

Name _____

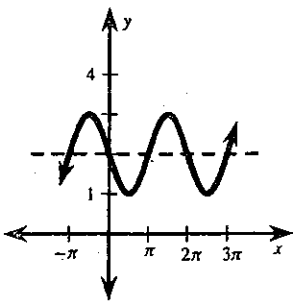
In 1–6, describe how the graphs of $y = \sin x$ or $y = \cos x$ can be shifted to produce the graph of the function.

1. $y = 5 + \sin x$
2. $y = \sin(x + \pi)$
3. $y = -4 + \cos(x - \frac{\pi}{4})$
4. $y = 2 + \sin(x + \frac{\pi}{2})$
5. $y = -2 + \cos(x - \pi)$
6. $y = \cos(x + \frac{\pi}{4})$

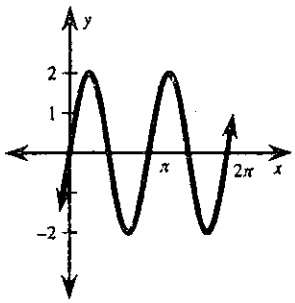
In 7–9, match the equation to its graph.

7. $y = -2\sin(2x + \pi)$
8. $y = 2 + \sin(x + \pi)$
9. $y = 2\sin(x - \pi)$

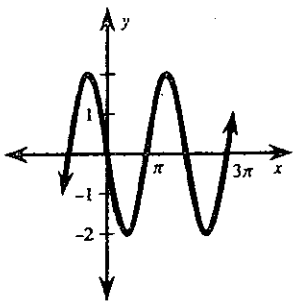
a.



b.



c.



10. The graph of $y = 3\sin\frac{1}{2}x$ is drawn, then shifted down $\frac{1}{2}$ unit. Write an equation of the resulting graph.

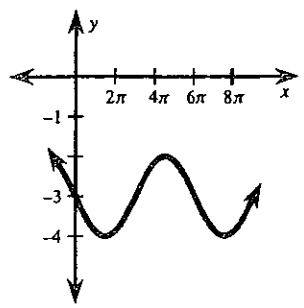
11. The graph of $y = 3\cos(x)$ is drawn, then shifted π units to the left and 2 units up. Write an equation of the resulting graph.

In 12–16, sketch the graph of the function.

12. $y = 3 + \cos(x - \frac{\pi}{2})$
13. $y = 4 - \frac{1}{2}\cos(x)$
14. $y = 1 - \sin\frac{1}{2}\pi x$
15. $y = -2 + \sin(2x + \frac{\pi}{2})$
16. $y = 2 + 2\cos(x - \pi)$

17. What are the minimum and maximum values of $y = 3 - 2\cos 2x$? Write two x-values at which the minimum occurs. Write two x-values at which the maximum occurs.

18. Write an equation of the graph below.



19. Suppose that the brightness of a distant star is given by

$$y = 10.5 + 5.2\cos\left(\frac{\pi t}{20} + 40\right)$$

where t is given in days. Sketch the graph for $0 \leq t \leq 80$. Which day(s) is the brightness the greatest? Which day(s) is the brightness the least?