

14 CHAPTER TEST

Graph the function.

1. $f(x) = 4 \cos 2x$

2. $y = \frac{3}{2} \sin \pi x$

3. $f(x) = -4 \tan \frac{\pi}{2}x$

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

5. $f(x) = 3 \tan\left(x - \frac{\pi}{2}\right)$

6. $y = -2 \cos \frac{1}{3}x + 3$

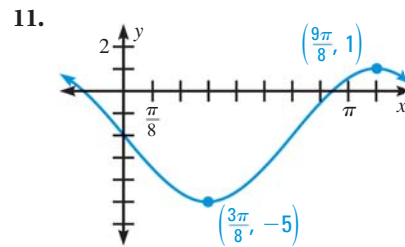
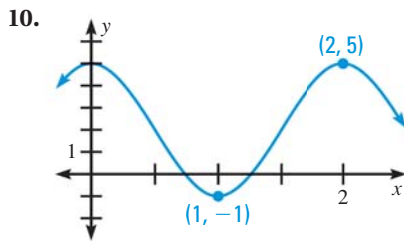
Simplify the expression.

7. $\frac{\sin(-\theta)}{\tan(-\theta)}$

8. $\cos^2 x + \sin^2 x - \csc^2 x$

9. $\frac{\sin\left(\frac{\pi}{2} - x\right)}{\sec x}$

Write a function for the sinusoid.



12. Verify the identity $\cos 3x = 4 \cos^3 x - 3 \cos x$.

Solve the equation in the interval $0 \leq x < 2\pi$.

13. $9 \sin^2 x \tan x = 16 \tan x$

14. $(1 - \tan^2 x) \tan 2x = 2\sqrt{3}$

15. $\sin \frac{x}{2} = \frac{\sqrt{2}}{2}$

Find the general solution of the equation.

16. $6 \tan^2 x - 2 = 0$

17. $\cos x = \sin 2x \sin x$

18. $\sin \frac{x}{2} = 1 - \cos x$

Find the exact value of the expression.

19. $\sin 255^\circ$

20. $\cos\left(-\frac{\pi}{8}\right)$

21. $\tan \frac{5\pi}{12}$

22. $\sin \frac{10\pi}{3}$

23. **BOATING** The paddle wheel of a ship is 11 feet in diameter, revolves 15 times per minute when moving at top speed, and is 2 feet below the water's surface at its lowest point. Using this speed and starting from a point at the very top of the wheel, write a model for the height h (in feet) of the end of the paddle relative to the water's surface as a function of time t (in minutes).

24. **PRECIPITATION** The table below shows the monthly precipitation P (in inches) in Bismarck, North Dakota. The time t is measured in months, with $t = 1$ representing January. Use a graphing calculator to write a sinusoidal model that gives P as a function of t .

t	1	2	3	4	5	6	7	8	9	10	11	12
P	0.5	0.5	0.9	1.5	2.2	2.6	2.6	2.2	1.6	1.3	0.7	0.4