Secondary Math 3   Name_____

10.1 The Sine Function

Date_____ Period_____

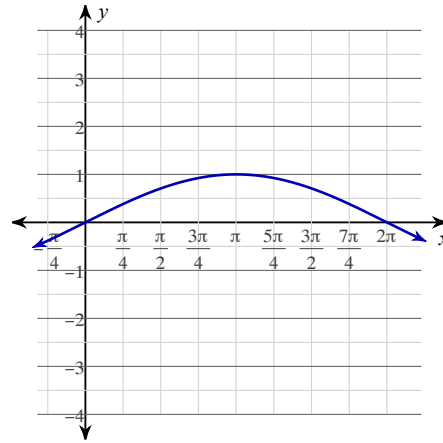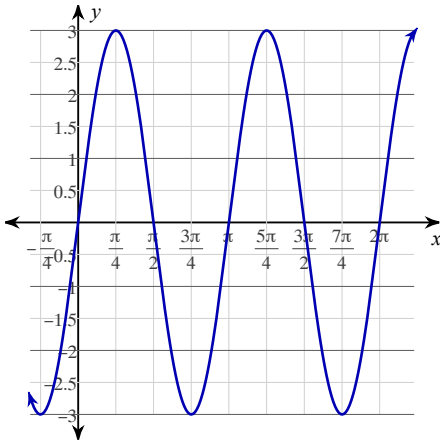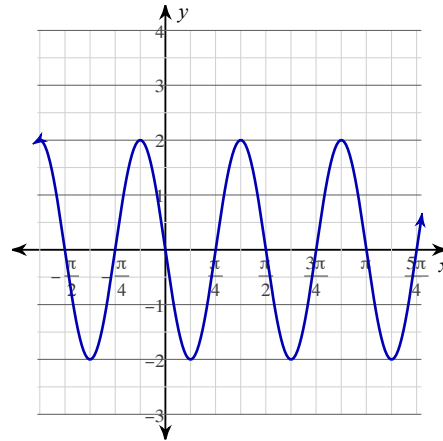**Determine the frequency, period, and amplitude of each function.**

1)
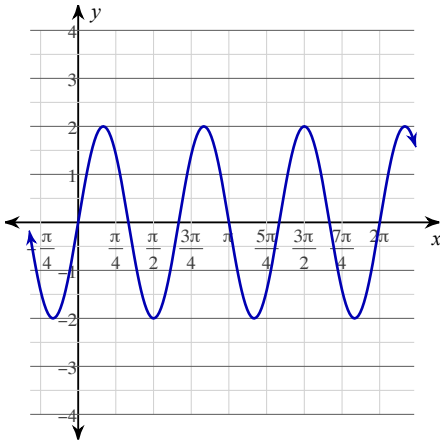
2)

3)

4)

Using radians, find the amplitude, number of cycles, and period of each function.
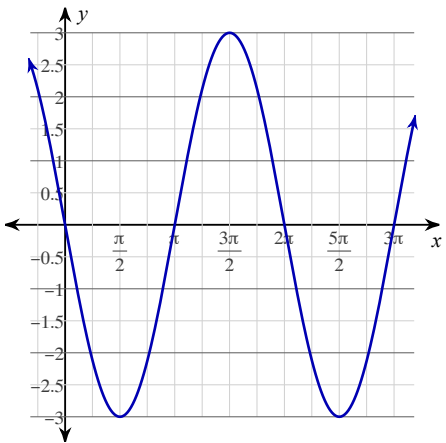
5) $y = 8\sin\dfrac{\theta}{2}$

6) $y = \dfrac{1}{9} \cdot \sin 8\theta$

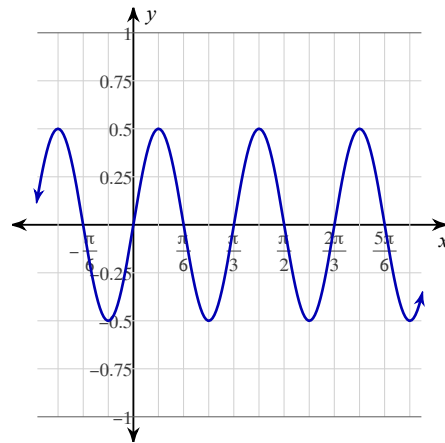7) $y = \dfrac{1}{8} \cdot \sin\dfrac{\theta}{7}$

8) $y = 7\sin 8\theta$
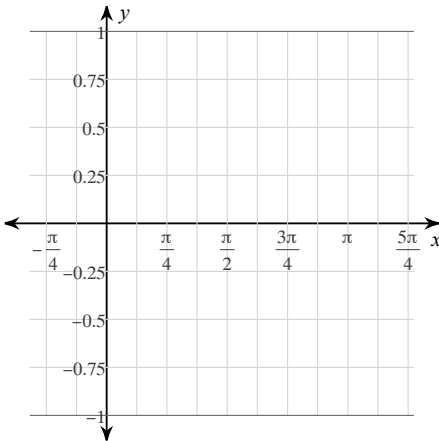
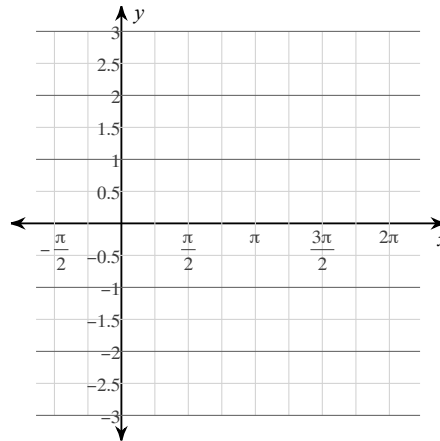**Write an equation for each sine function.**

9)

10)

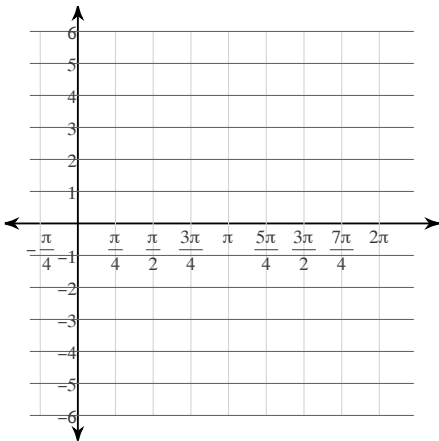**Sketch one cycle of each sine curve. Assume a>0. Write an equation for each graph.**

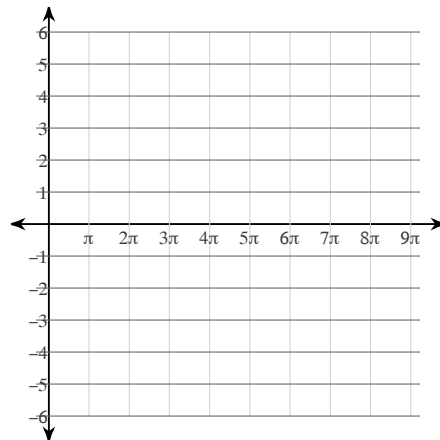11) amplitude 1/2; period π

12) amplitude 3; period 2π

13) $y = 4\sin 3\theta$

14) $y = \sin \dfrac{\theta}{3}$

Describe the transformations in each equation.
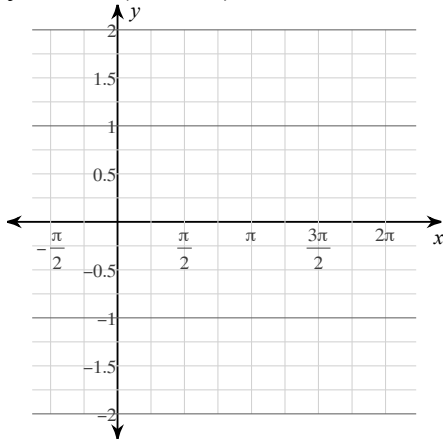
15) $f(x) = \sin(x - \pi/2) + 1$

16) $y = \sin(x + \pi) - 4$
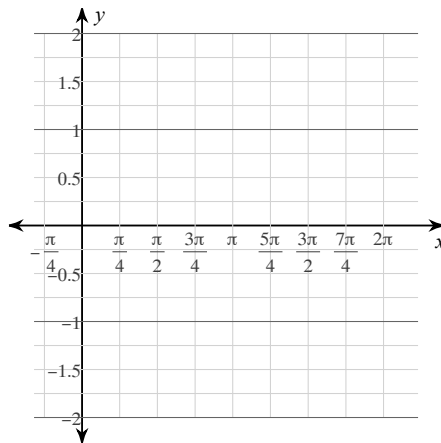
17) $y = \sin(x - 3) - \dfrac{1}{2}$

18) $y = \dfrac{1}{4}\sin 2(x - \pi/3) + 4$

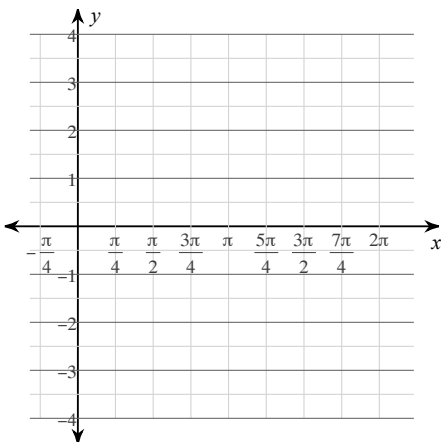**Graph each function in the interval from 0 to 2π.**
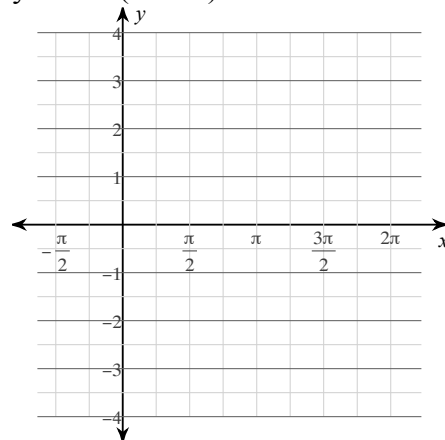
19) $y = \sin 2(x + \pi/2) - 1$
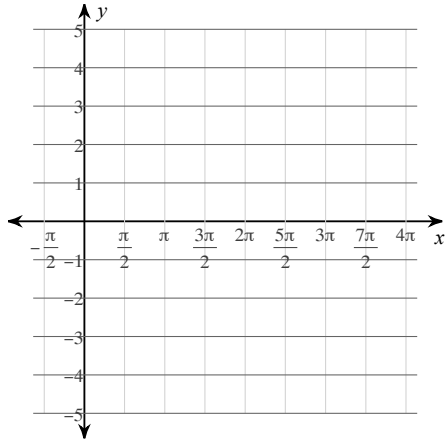

20) $y = \sin(x - \pi)$
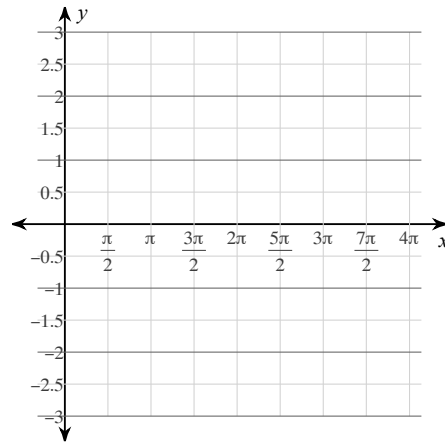

21) $y = -2\sin(x - \pi) + 3$

22) $y = -\sin(x + \pi/2) + 2$

23) $y = 3\sin(2x) - 1$

24) $y = 1.5 \sin\dfrac{1}{2}(x - \pi/4)$

Write an equation for each translation.

25) $y = \sin x$; 3 units up; phase shift to the right $\pi/3$; a>0

26) $y = \sin x$; reflection over x-axis, 1.5 units to the right; 3 units down; amplitude 4

27) $y = \sin x$; 4 units up and $2\pi/3$ units to the left; amplitude $\dfrac{1}{3}$; a > 0

28) $y = \sin x$; period 3π, phase shift π, and vertical shift -5; a < 0

29) Two students disagree on the translation for $y = \sin 3(x + \pi/6)$. Amberly says that it is $\pi/2$ units to the left of $y = \sin 3x$. Scott says that it is $\pi/6$ units to the left of $y = \sin 3x$. Is either student correct? Describe any errors of each student.