

# 13.4 Notes Continued...

⑦  $a = 2$   $p = \pi$

Sketch 1 cycle.  
Write the equation.

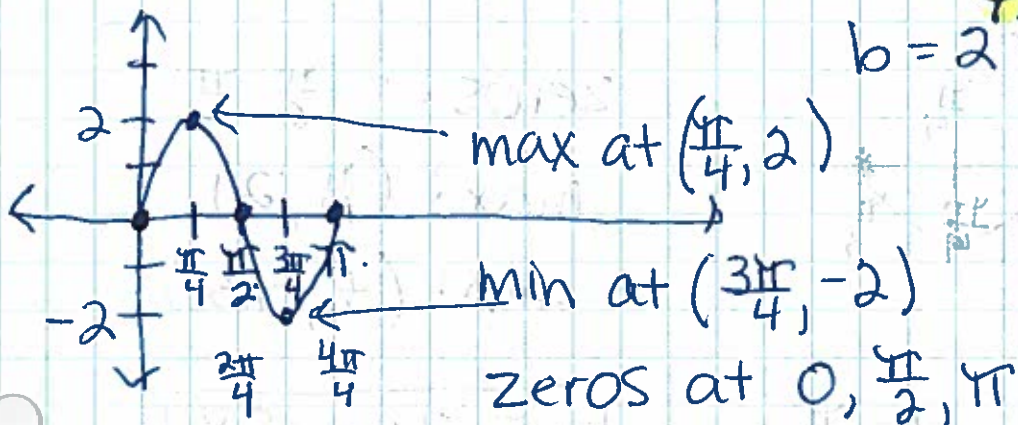
$$y = a \sin bx$$

$$y = 2 \sin 2x$$

$$b = \frac{2\pi}{p} \quad p = \frac{2\pi}{b}$$

$$b = \frac{2\pi}{\pi}$$

$$b = 2$$

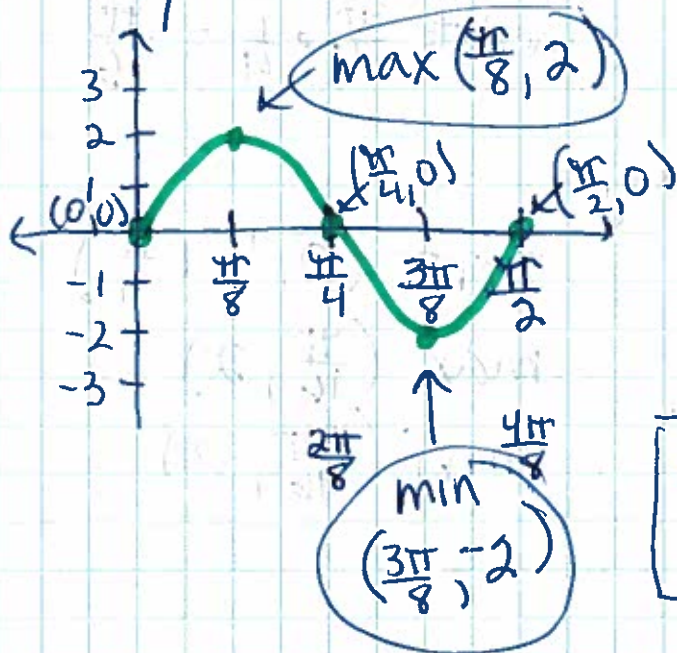


⑨ amplitude = 2  $p = \frac{\pi}{2}$

$$b = \frac{2\pi}{\frac{\pi}{2}} \quad \left. \begin{array}{l} \\ \end{array} \right\} 2\pi \div \frac{\pi}{2}$$

$$y = 2 \sin 4x$$

$$2\pi \cdot \frac{2}{\pi} = 4$$



increments =  $p \div 4$

$$\frac{\pi}{2} \div 4$$

$$\frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8}$$

Zeros:  
 $0, \frac{\pi}{4}, \frac{\pi}{2}$

$$y = a \sin bx$$

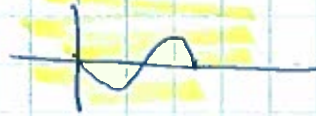
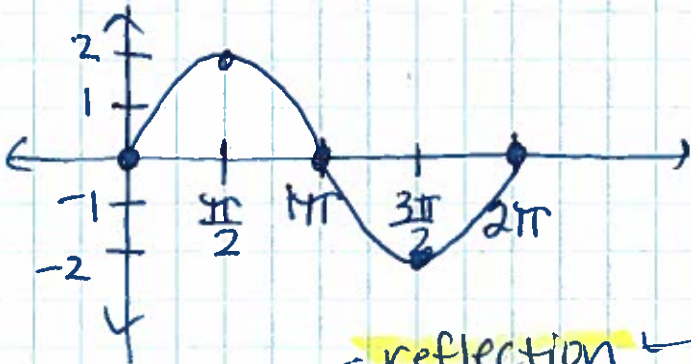
$$(13) y = 2 \sin \theta$$

$$a = 2$$

$$b = 1$$

$$P = \frac{2\pi}{b}$$

$$P = \frac{2\pi}{1} = 2\pi$$



$$(18) y = -5 \sin 3\theta$$

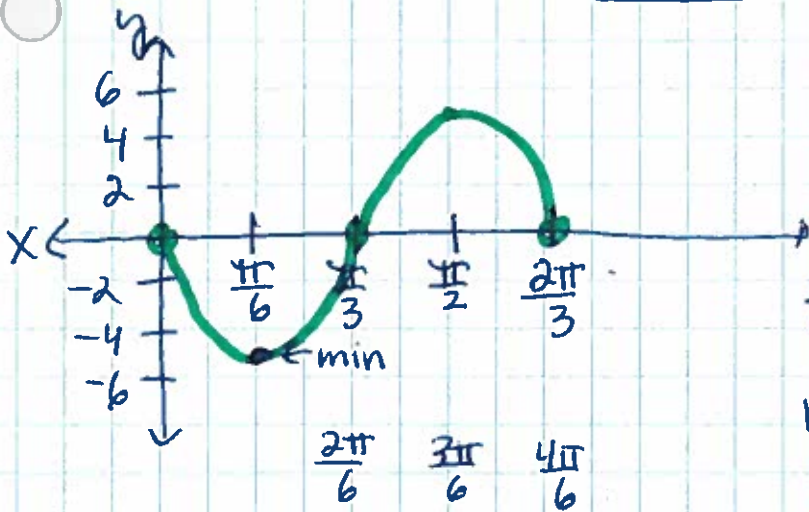
amplitude  $|a|$   $|-5| = 5$   $b = 3$

$$P = \frac{2\pi}{b}$$

$$P = \frac{2\pi}{3}$$

increments  
 $P \div 4$  or  $P \cdot \frac{1}{4}$

$$\frac{2\pi}{3} \cdot \frac{1}{4} = \frac{\pi}{6}$$



Zeros:  $(0, \frac{\pi}{3}, \frac{2\pi}{3})$

min:  $(\frac{\pi}{6}, -5)$

max:  $(\frac{\pi}{2}, 5)$

$$b = \frac{2\pi}{p}$$

Day \_\_\_\_\_  
Date \_\_\_\_\_

Name \_\_\_\_\_ Class \_\_\_\_\_

### Practice 13-4

$$y = a \sin bx$$

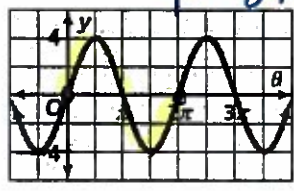
The Sine Function

Find the amplitude and period of each sine curve. Then write an equation for each curve.

$$\frac{1}{2}(4 - (-4)) = 4$$

$$\frac{1}{2}(8) = 4$$

$$a = 4$$

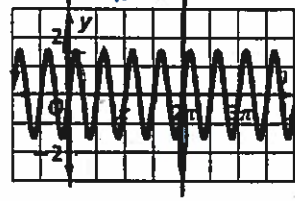


$$p = 2\pi$$

$$b = \frac{2\pi}{2\pi}$$

$$b = 1$$

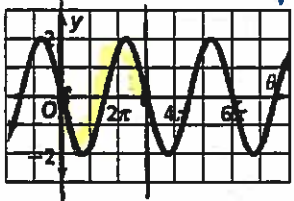
$$a = 1.5 \quad b = 4$$



$$p = 2\pi$$

$$b = \frac{2\pi}{\pi/2}$$

$$b = 4$$



3.

$$b = \frac{2\pi}{p}$$

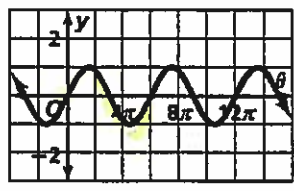
$$b = \frac{2\pi}{3\pi}$$

$$b = \frac{2}{3}$$

$$a = 2$$

$$a = 1$$

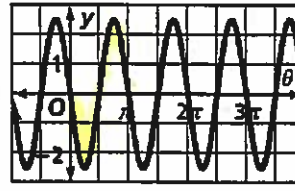
$$p = 6\pi$$



5.

$$a = 2.5$$

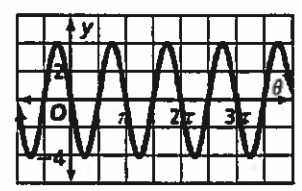
$$p = \pi$$



6.

$$a = 4$$

$$p = \pi$$



$$a = \frac{2\pi}{6\pi}$$

1.  $y = 4 \sin x$

2.  $y = 1.5 \sin 4x$

3.  $y = -2 \sin \frac{2}{3}x$   
calculator  $-2 \sin((2/3)x)$

4.  $y = \sin \frac{1}{3}x$   
 $a = 1 \quad p = 6\pi$

5.  $y = -2.5 \sin 2x$   
 $a = 2.5 \quad p = \pi$

6.  $y = -4 \sin 2x$   
 $a = 4 \quad p = \pi$

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

7. amplitude = 2; period =  $\pi$

8. amplitude = 3; period =  $2\pi$

9. amplitude = 2; period =  $\frac{\pi}{2}$

10. amplitude = 2; period =  $\frac{\pi}{4}$

11. amplitude = 1.5; period =  $\frac{\pi}{3}$

12. amplitude = 2.5; period =  $2\pi$

Amplitude is positive (up down down up)

if there's a reflection  
↓ ↑ ↑ ↓

Sketch one cycle of the graph of each sine function.

13.  $y = 2 \sin \theta$

14.  $y = -2 \sin 4\theta$

15.  $y = \sin 2\theta$

16.  $y = 3 \sin \frac{\theta}{2}$

17.  $y = -\sin 2\theta$

18.  $y = -5 \sin 3\theta$

19.  $y = -3 \sin 2\theta$

20.  $y = 4 \sin 5\theta$

21.  $y = -4 \sin \frac{\theta}{2}$