

Get a calculator

October 9

SWBAT:

Graph and transform the  
sine and cosine functions

- b. If  $b = 1$  and  $c = 1$ , what is the horizontal shift of the graph? left 1
- c. If  $b = 1$  and  $c = 2$ , what is the horizontal shift of the graph? left 2
- d. If  $b = 2$  and  $c = 2$ , what is the horizontal shift of the graph? left 1
- e. If  $b = 2$  and  $c = 2$ , what is the horizontal shift of the graph? \_\_\_\_\_
- f. If  $b = 0.5$  and  $c = 1$ , what is the horizontal shift of the graph? left 2
- g. If  $b = 0.5$  and  $c = 2$ , what is the horizontal shift of the graph? left 4
- h. Complete the following statement:  
For  $a \neq 0$  and  $b > 0$ , the graph of  $f(x) = a \sin(bx + c) + d$  has a horizontal shift of  $-\frac{c}{b}$ .

5. For functions of the form  $f(x) = a \sin(bx + c) + d$  or  $g(x) = a \cos(bx + c) + d$ , with  $a \neq 0$  and

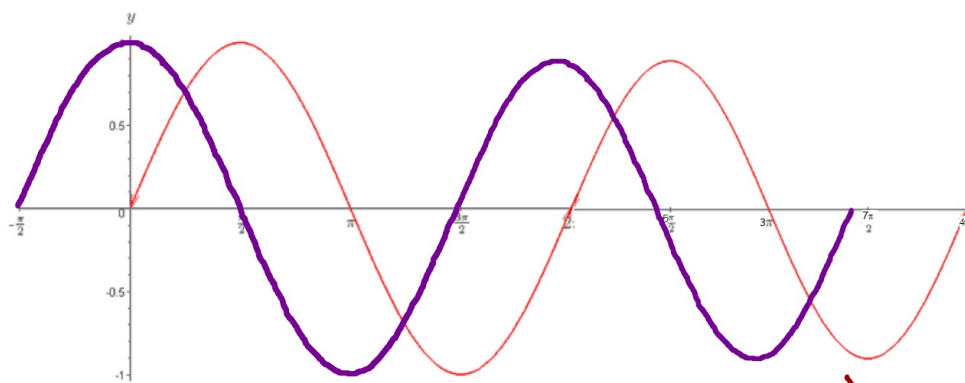
$b > 0$ ,

a. the amplitude is  $a$ .

b. the period is  $\frac{2\pi}{b}$ .

c. the horizontal shift is  $-\frac{c}{b}$ .

d. the vertical shift is  $d$ .



$\sin(x)$

$$\cos(x) = \sin\left(x + \frac{\pi}{2}\right)$$

8. a. Write an equation for a sine function with an amplitude of 4, a period of 12, a horizontal shift of 2, and a vertical shift of 3.

- b. Write an equation for a cosine function with the same parameters as the sine function in part (a).

$$a = 4$$

$$b = \frac{\pi}{6}$$

$$c = -\frac{\pi}{3}$$

$$d = 3$$

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

$$\frac{2\pi}{b} = 12$$

$$\frac{2\pi}{12} = \frac{12b}{12}$$

$$\frac{\pi}{6} = b$$

$$-\frac{c}{b} = \text{h. shift}$$

$$-\frac{c}{\frac{\pi}{6}} = 2$$

$$-c = 2\left(\frac{\pi}{6}\right) = \frac{2\pi}{6}$$

$$c = -\frac{\pi}{3}$$

$$y = 4 \sin\left(\frac{\pi}{6}x - \frac{\pi}{3}\right) + 3$$