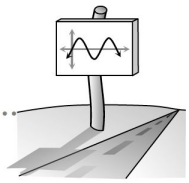
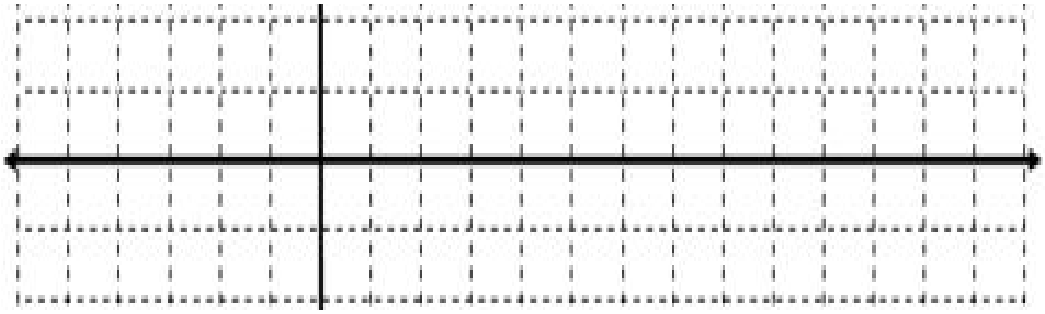
**CW#___** Name:_____

## 2.2.4 How do I shift trig functions?

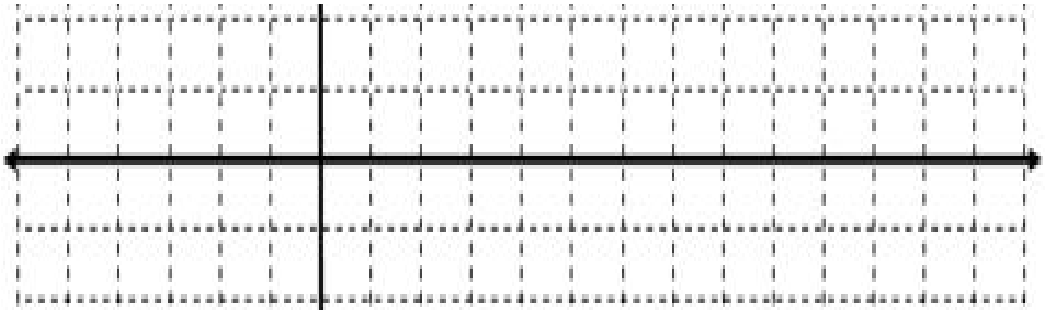
Transformations of Sine and Cosine



**#93** Sketch a graph of $y = \sin(x)$ that shows the general shape of the curve and key points. Label the coordinates of the points you feel are key points in creating this graph.



a. Sketch a graph of $y = \sin(x)$ that is translated $\frac{\pi}{3}$ units to the right. Again, label the points you feel are key points in creating this graph. Then write an equation for this graph.



**Equation:**

b.Now sketch a graph of $y = \sin(x)$ that is translated 2 units up. Again, label the points you feel are key points in creating this graph. Then write an equation for this graph.

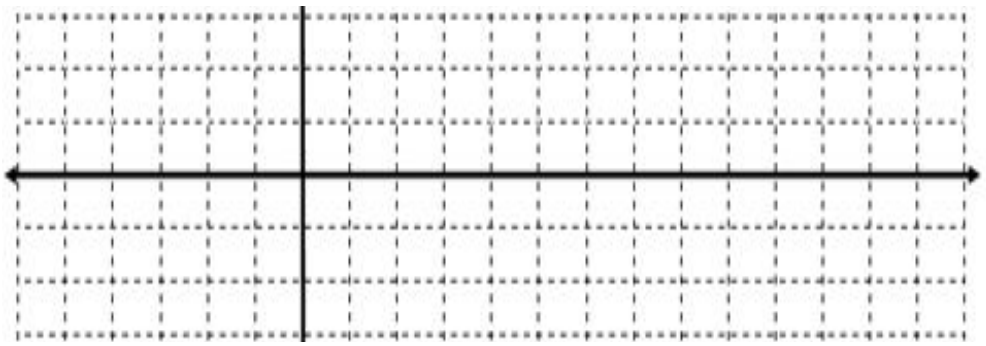
**Equation:**

c.Verify your answers for parts (a) and (b) using a calculator. Make adjustments if necessary.

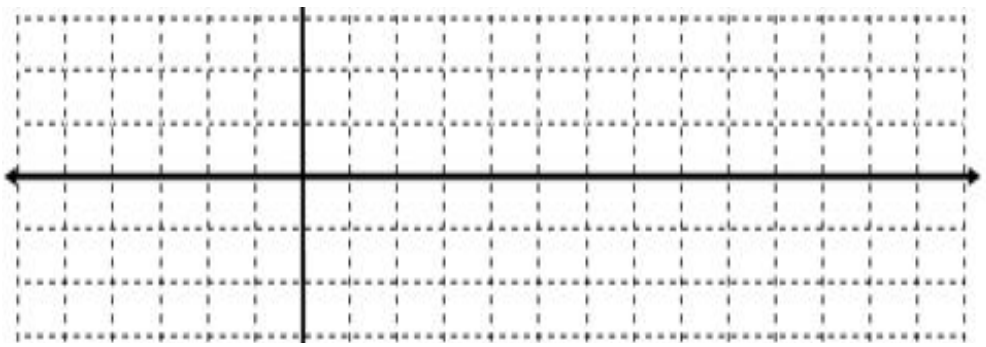
**#94** Sketch a graph of each of the following functions, labeling the key points. Be sure to graph at least two cycles. As you sketch the curves, think about a general method that can be used to sketch the graph of any sinusoidal function. Be prepared to share your strategies with the class.

a. $y = \sin(x) - 2$

b. $y = \cos(x) + 1$

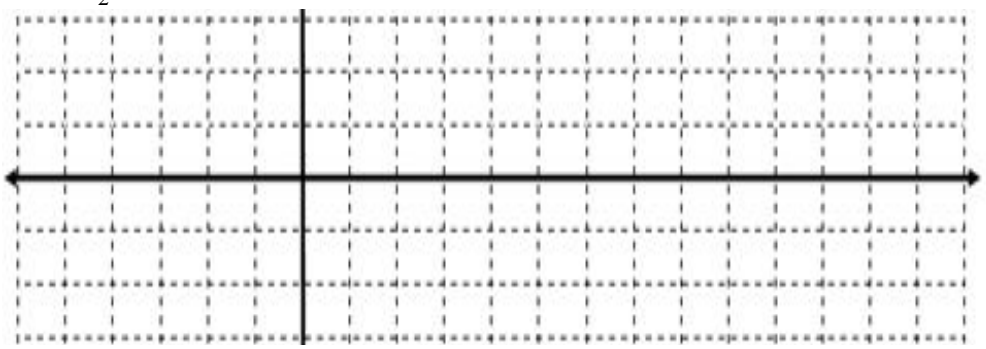


c. $y = \sin(x - \frac{\pi}{4})$



**#94 Continued**

d. $y = \cos(x + \frac{\pi}{2})$



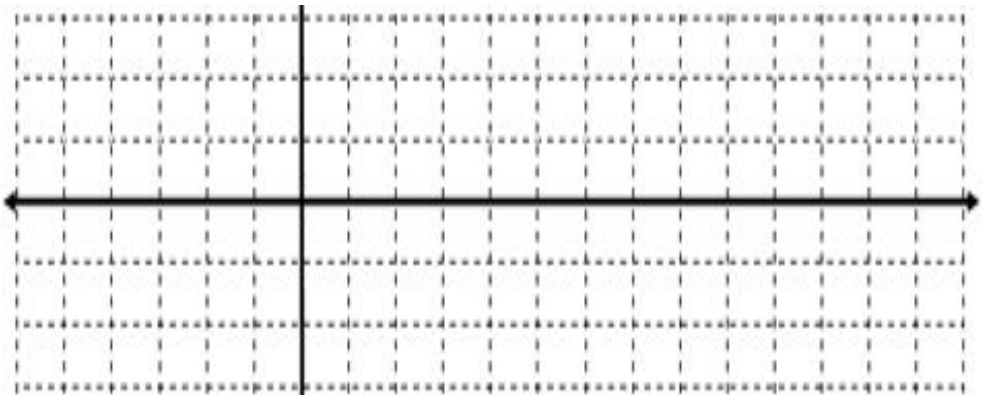
e. $y = \sin(x - \frac{\pi}{4}) - 2$

f. $y = \cos(x + \frac{\pi}{2}) + 1$

**#95** The midline of a sinusoidal (relating to the sine curve) function is the horizontal line that splits the graph of the function in half. The distance between the midline of the function and a maximum or minimum point on the graph is called the amplitude.

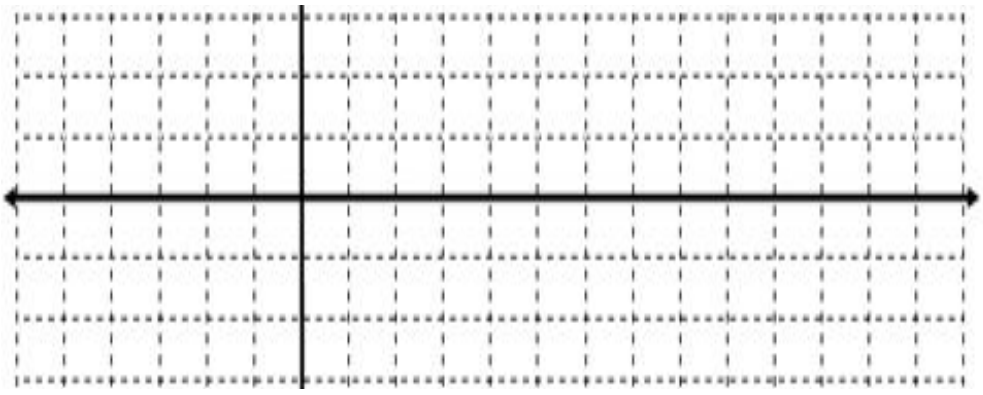
a. What is the amplitude of $y = \sin(x)$? What about $y = \cos(x)$?

b. Sketch a transformation of $y = \sin(x)$ that has an amplitude of 3. Then write the equation of the transformed graph. Check your answer with a graphing calculator.



**Equation:**

c. Now sketch a transformation of $y = \cos(x)$ that has an amplitude of $\frac{1}{2}$ and write the corresponding equation. Check your answer with a graphing calculator.



**Equation:**