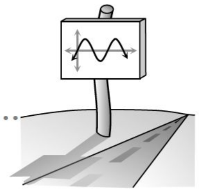
CW#___ Name:______________________________

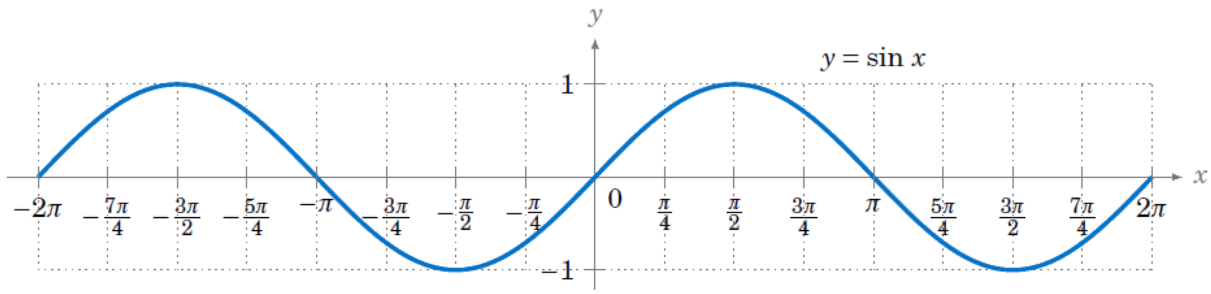
2.2.5 How do I stretch a sine wave?

Horizontal Stretches of Sine and Cosine Graphs

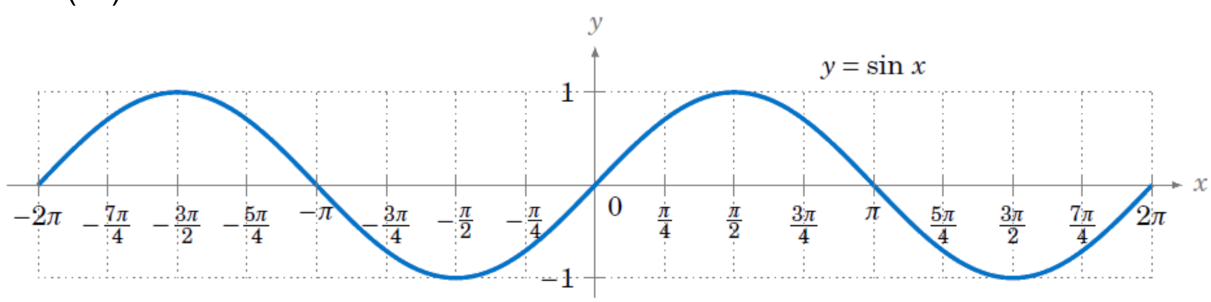


#107 Use a calculator to graph each functions in parts (a) through (c) below on top of one of the parent graph *f*(*x*) = sin(*x*).

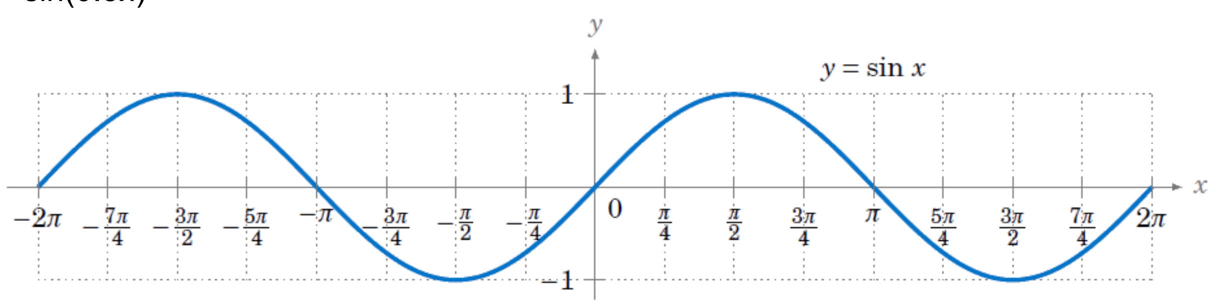
a. *f*(*x*) = sin(2*x*)



b. *f*(*x*) = sin(3*x*)

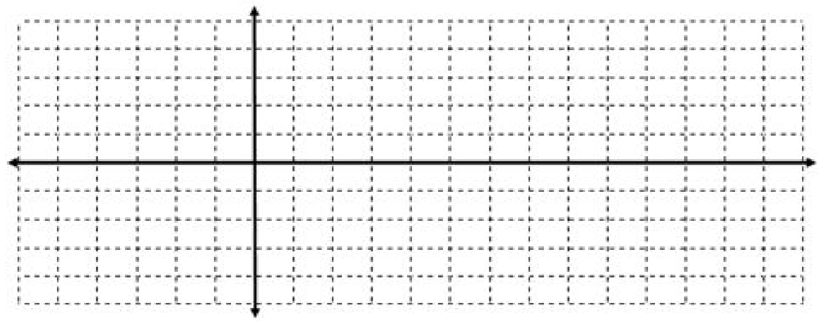


c. *f*(*x*) = sin(0.5*x*)



d. In the general equation *f*(*x*) = sin(*bx*), how does the value of *b* change the graph of *f*(*x*) = sin(*x*)?	e. State the period for each of the functions you graphed in parts (a) through (c).
f. For each of the functions in parts (a) through (c), how many periods occur in 2*π*?	g. What is the period of the graph of *y* = sin(*bx*)?

#108 Graph $f(x) = 2\sin(x) - 1$. Then use your graph of $y = f(x)$ to graph $g(x) = 2\sin(3x) - 1$ on the same set of axes

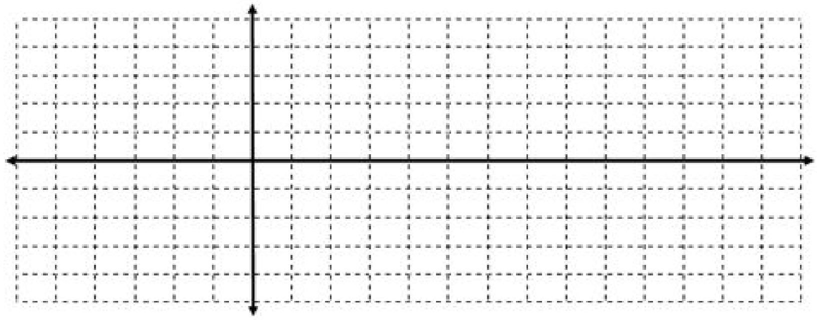


How are the two graphs the same?

How are the two graphs different?

#109 Sketch a graph of each of the following functions, labeling the key points. As you sketch the graphs, 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. For each function, state the *b*-value and the period of the graph.

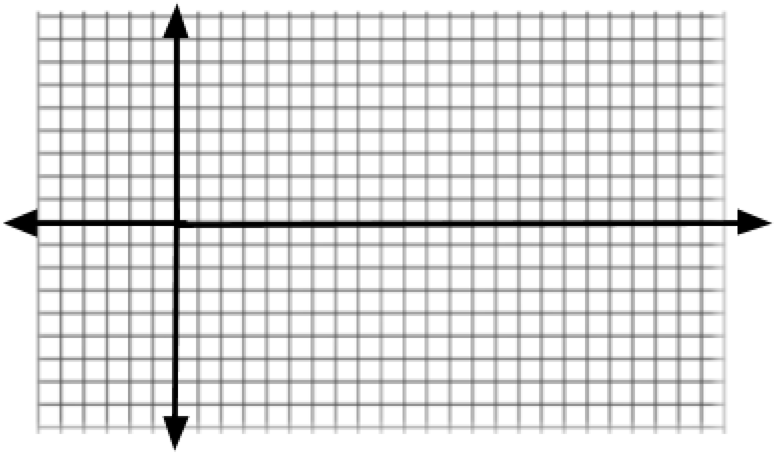
a. $f(x) = -2\sin(4x) + 3$



Midline:
Amplitude:
b - value:
Period:

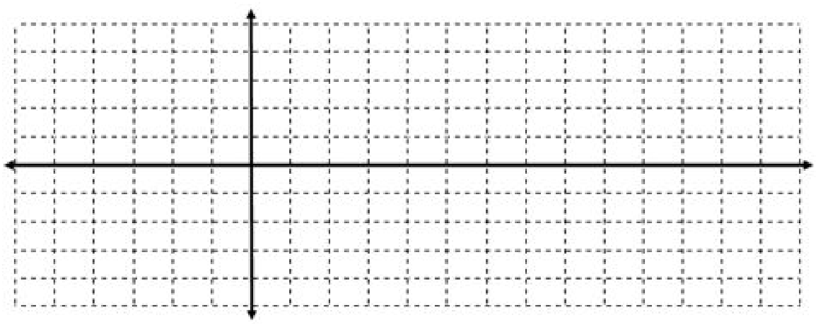
#109 Continued

b. $h(x) = 5\cos\left(\frac{x}{3}\right) - 3$



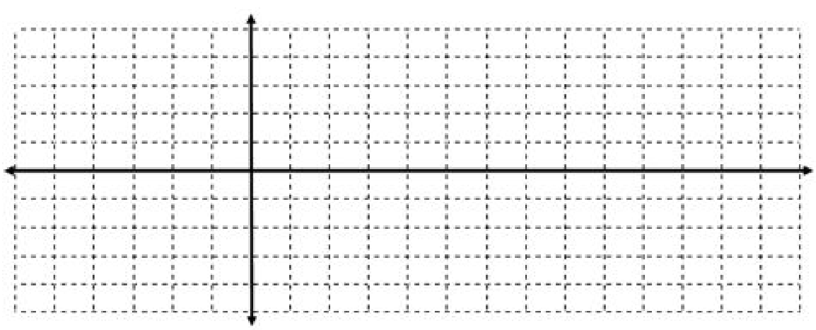
Midline:
Amplitude:
b - value:
Period:

c. $g(x) = 3\sin\left(\frac{\pi}{2}x\right)$



Midline:
Amplitude:
b - value:
Period:

d. $j(x) = 4\cos\left(\frac{2\pi}{7}x\right) - 1$



Midline:
Amplitude:
b - value:
Period: