**Activity 6.4.2b – Stretch It! Trig**

**Part 1: Investigating Vertical Stretch/Compression**

Open an applet for graphing translations of the sine function. One is provided in the file Activity\_6\_4\_1\_b\_GeoGebra\_Code\_06\_22\_15

1. Type k\*sin(x) into the input box for “Parent Function” and press enter.
2. Move the slider left and right to change the value of ‘k’ or enter a specific value for k in the rectangle.
3. Click the red button to explore the graph of .
4. After investigating the behavior of , explore how multiplication by k on the outside of the function affects the graphs of and by typing these functions into the input box. Press enter. Use the sliders to change k.
5. Make a conjecture about how the value of transforms the graph of *f*(*x*) to the graph of *g*(*x*), when is on the “outside” of the function.
6. Does your conjecture hold if ? If not, modify your conjecture.
7. Does your conjecture hold if ? If not, modify your conjecture.

1. Does your conjecture hold if ? If not, modify your conjecture.
2. Does your conjecture still hold if ? If not, modify your conjecture.
3. Sketch graphs for the following functions.







**Part 2: Investigating Horizontal Stretch/Compression**

1. Type sin(x) into the Parent Function box of the applet, and press enter.
2. Click the blue button to explore the graph of .
3. Move the slider to change the value of or enter values into the input box.
4. Next, investigate how multiplying the input variable by k affects the graphs of and by typing these functions into the input box.
5. Make a conjecture about how the value of transforms the graph of to the graph of , when is on the “inside” of the function.
6. Does your conjecture hold for ? If not, modify your conjecture.
7. Does your conjecture hold for ? If not, modify your conjecture.
8. Does your conjecture hold if ? If not, modify your conjecture.

1. Does your conjecture still hold if ? If not, modify your conjecture.
2. Sketch graphs of the following and identify the period of the function.
   1. period is \_\_\_\_\_\_\_\_\_
   2. period is \_\_\_\_\_\_\_\_\_
   3. period is \_\_\_\_\_\_\_\_\_
3. Generalize what you learned about and to graph two full periods of the following functions using translations and transformations. Suggestion: before you sketch the wave, determine the midline, the maximum and the minimum values. Sketch in the dotted horizontal lines for the midline, y = maximum value and y = minimum value. Next, determine the period. On the midline, plot the 3 points at the beginning of a period, the end of the period, and halfway through the period. Determine the amplitude for each function.

























