**Graph Transformations Lab** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The coefficients in  have the same effect on the graph as they did on the functions we discussed in MAT 171 algebra. This time we will focus on transforming the primary period of the sine wave.

Upper Bound

One Quarter Point

Amplitude

Center Line

End Point

Mid Point

Start Point

Vertical Shift

Amplitude





Three

Quarter Point

Lower Bound

Phase

Shift



Period



**To create the primary period graph when given a sine function:**

1) Determine the Vertical Shift is  and draw a (dashed) Center Line at .

2) Determine the Amplitude is  and draw (dotted) Bounds at  and .

3) Determine the Primary Period interval by solving 

Adding  gives: 

Dividing  gives: 

4) This shows us the Phase Shift is  and the Period is .

5) Noting whether the wave is ‘upside down’, plot, label and connect the five key points:

Start point at 

1st quarter point at 

Midpoint at 

3rd quarter point at 

End point at 

**To write the function when given the primary period of a sine graph:**

1) Determine  based on the location of the Center Line of the wave.

2) Determine  based on the Amplitude and whether the wave is “reflected” upside down.

3) Convert the given Primary Cycle into the basic interval  by solving 

Subtracting  gives: 

Multiplying  gives: 

4) This shows us  and .

Note: cosine graphs are similar except the primary period of the cosine wave is “out of phase” by  from sine, as discussed in the co-function identities, so its primary period starts on the max rather than the center.

#1-4: Identify the center line, amplitude, phase shift and period. Now, choose the axes locations and grid scale in order to *fill* the picture, then plot and label the five “key” points and graph of the primary period.

1) 





2) 





3) 







4) 



#5-6: Identify the appropriate trig function whose primary period is shown, and determine the four coefficients, then write the function.



5)



6)



