NAME _____   **INTRO TO TRIG**

UNIT 7

GRAPHING TRIG FUNCTIONS

DATE	PAGE	TOPIC	HOMEWORK
2/10	2,3	The Sin graph The Cos graph	No Homework
2/11	4,5	Investigation of Amplitudes	AMPLITUDE Homework Worksheet
2/12	6	Investigation of Frequencies	FREQUENCY Homework Worksheet
2/13	7	Finding periods and sketching graphs	PERIOD Homework Worksheet
2/14	x	Graphing Sin and Cos QUIZ	No Homework
2/17-2/21		WINER BREAK	Relax and enjoy your break
2/24	8	Graphing Tan	No Homework
2/25	x	More Tan and Review of all trig functions	FINISH REVIEW!
2/26		REVIEW	STUDY
2/27		TEST	NO HOMEWORK!

Graphing Sin x

In order to graph y=sin x, we will use the x-axis as a number line in terms of pi.

We will start by filling in the chart below:

X (radians)	0	π/6	π/3	π/2	2π/3	5π/6	π	7π/6	4π/3	3π/2	5π/3	11π/6	2π
X (degrees)													
Sin x													

Now we will take the values that we just found and sketch a graph.

**This curve represents the basic sine

Fill in the questions below using **Increases or Decreases**

From 0 to pi/2 (quadrant I), sin x _____ from 0 to 1.

From pi/2 to pi (quadrant II), sin x _____ from 1 to 0.

From pi to 3pi/2 (quadrant III), sin x _____ from 0 to –1.

From 3pi/2 to 2pi (quadrant IV), sin x _____ from –1 to 0.

Graphing Cos x

Now we will do the same thing for the graph of Cos x

X (radians)	0	π/6	π/3	π/2	2π/3	5π/6	π	7π/6	4π/3	3π/2	5π/3	11π/6	2π
X (degrees)													
COS x													

Fill in the questions below using **Increases or Decreases**

From 0 to pi/2 (quadrant I), cos x _____ from 0 to 1.

From pi/2 to pi (quadrant II), cos x _____ from 1 to 0.

From pi to 3pi/2 (quadrant III), cos x _____ from 0 to −1.

From 3pi/2 to 2pi (quadrant IV), cos x _____ from −1 to 0.

Investigation of Amplitude

The basic Sine and Cosine graphs can be manipulated by changing a and b in the equations below:

Y=a Sin bx   and   **y=a Cos bx**

Use your Graphing Calculator to find out what the "a" does to the graph:

STEP 1: Graph y=sinx (in this case a=1)
- Change your window. Your x-min should be 0, x-max should be 2π, y-min should be -5, y-max should be 5.
- Go to y= and input Sinx
- Hit GRAPH

STEP 2: Investigate the graph of y=sinx
- What is the maximum value of the graph? _____

- What is the minimum value of the graph? _____

- When does the graph hit the x-axis (in terms of π)? _____
STEP 3: Graph y=2sinx (a=2)

- What is the maximum value of the graph? _____

- What is the minimum value of the graph? _____

- When does the graph hit the x-axis (in terms of π)? _____
STEP 4: Graph y=3sinx (a=3)
- What is the maximum value of the graph? _____

- What is the minimum value of the graph? _____

- When does the graph hit the x-axis (in terms of π)? _____

STEP 5: Make a conjecture (best guess) about the effect of "a" on the graph of the equation y=asinx

_____

_____

STEP 6: Test your guess by predicting the maximum and minimum values for the graphs
    below:
- Y=1/2 sinx   y=4sinx
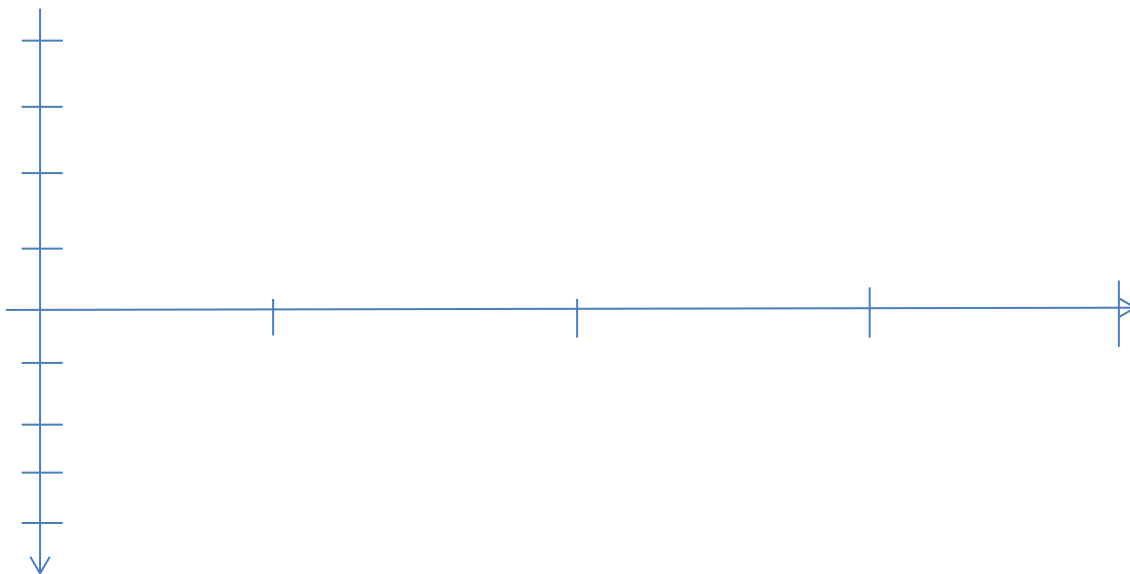
    Max: _____   Max:_____

    Min:_____   Min:_____

STEP 7: Think about what would happen if "a" was negative.
- Graph y=-sinx
- Graph y=-2sinx
- What happens? _____

STEP 8: Make a sketch.
- Sketch all of the graphs above and label them.

- What Equations are "missing" if you wanted to "complete" the picture?

    1. _____

    2. _____

    3. _____

INVESTIGATION OF FREQUENCY

The basic Sine and Cosine graphs can be manipulated by changing a and b in the equations below:

Y=a Sin bx   and   **y=a Cos bx**

Use your Graphing Calculator to find out what the "b" does to the graph:
>   STEP 1: Graph y=sinx (in this case b=1)
>   - Your x-min should be 0, x-max should be 2π, y-min should be -5, y-max should be 5.
>   - Go to y= and input Sinx
>   - Hit GRAPH
>   - Sketch the basic sin curve from 0-2π:
>
>
>
>   STEP 2: Graph y=sin2x
>   - How many sin curves do you see?_____
>
>   STEP 3: Graph y=sin3x
>   - How many sin curves do you see?_____
>
>   STEP 4: Make a Conjecture (best guess) as to what effect "b" has on the graph:

_____

>   STEP 5: Testing your conjecture
>   - Sketch what you think y=sin(1/2)x will look like:
>
>
>
>   - Now graph y=sin(1/2)x in your graphing calculator. Were you right? _____
>
>   STEP 6: Sketching more graphs
>
>   - Sketch y=sin4x:

6

THE PERIOD OF A GRAPH

Based on what we've learned we know that

- "a" is for _____ and determines the _____ of the graph.
- "b" is for _____ and determines the number of curves

  between _____ and _____

- The Period of a graph is _____.

- To find the period of a graph use:

- To determine what interval to use on the x-axis:

1.) y=3cos1/2x

    Amplitude:

    Frequency:

    Period:

    x-interval:

2.) y=1/2sin3x

    Amplitude:

    Frequency:

    Period:

    x-interval:

3.) Sketch the graph of the curve y=2cos2x:

4.) Sketch the graph of the curve y=-sin1/2x:

GRAPHING TAN FUNCTION

Start out by making sure that your mode is set to degrees.

Now set up your window as follows:

>Xmin: -2π
>Xmax: 2π
>Ymin: -3
>Ymax: 3

1.) In the "Y=" menu, type "Tan(x)

To see the graph use the "graph" key.

2.) There will be several vertical lines on the graph. These lines are called_____

3.) At the asymptotes for the function y=tan(x) is _____

4.) What are the x values for these asymptotes?_____

5.) What are the values for when y=0? _____

6.) What are the Max and min of the graph? _____

7.) Sketch the graph below: