Week 12 Pre-Calc Assignment:

Day 1: pp. 307-310 #1-41 odd
Day 2: pp. 307-310 #42-71 odd, 75-79 odd, 87-93 odd
Day 3: pp. 318-321 #1-27 odd
Day 4: pp. 318-321 #29-53 odd, 59-69 odd, 73, 75a), 75b), 85-95 odd

Notes on Assignment:

Pages 307-310:

#1-13: Refer to the definition box on p. 304.

#15-25: These questions are about transformations. You can see sec. 1.6 for a general review, or review section 4.5 for specific examples of trig transformations. The terminology regarding trig transformations will include talking about changes in amplitude, periods, and shifts.

#27-51: Most of these are more easily graphed if you don't use graph paper. Draw the x- and y-axes and mark off the measurements based on your specific problem.

#53-57: If you use the [ZOOM] [ZTrig] function, you will get a window that is $-2\pi<x<2\pi$ and $-4<y<4$. If that does not give you a good picture (at least 2 periods) of your function, you will have to adjust the window. To do this, you need to figure out your amplitude and period and set your window to accommodate your amplitude (along with any horizontal shift) and 2 periods. Also, be careful with your ( ). Close all of them and remember to put quotients in ( ).

#59-61: The line y = d is the line about which your function oscillates and your value of a tells you how many units you need to go above and below your line y = d.

#63-65: Set up your domain for your function based on the endpoints of one period. For example, for #63 one period goes from $-\pi/2$ to $\pi/2$. Set up the interval $\frac{-\pi}{2} \leq x \leq \frac{\pi}{2}$. Work with that until you get $0\leq x\leq 2\pi$ (our normal domain for a period of sine.) What you end up with in the middle will be your argument for your function (ie. the (bx-c)).

#67: What you are doing is graphically solving $\sin x = \frac{1}{2}$. Graph each side separately, and then see where the 2 curves intersect. Use the [CALC] [Intersect] feature to find the coordinates of the points of intersection.

#69a): This means find the period.

#69b): Take the time that it takes for one cycle (your answer for part (a)) and see how many times it will happen in 60 seconds.

#71b): The variable p here stands for the period (which you had to find for part (a)).

#75b): This graph oscillates about the line y = 30.3. If you look at the graph you see that for every point above the line y = 30.3 there is a point below the line to offset it. Therefore, the average is always going to be the y-value of the line about which your curve oscillates. This is also the amount of the vertical shift of your graph from 0.

#87-93: Expand or contract the expressions.

<u>Pages 318-21</u>:

#7-27: For tangent and cotangent, figure out the period and of one cycle, put in your asymptotes and find a point between the asymptote and intercept to determine the steepness. For secant and cosecant, remember to graph the function with the reciprocal trig function inserted in your original equation. From that, determine the asymptotes and sketch the graph.

#29-37: Set the [MODE] to [Connected]. This will allow you to see the asymptotes. You will need to determine the period so that you can set your window to accommodate 2 periods. Since all of these functions go to "infinity, you can set your y range at -10<y<10 to start with and adjust accordingly as you see your graph. There are no buttons for cot, sec, or csc, so you have to use either the [x^{-1}] button along with the reciprocal function, or do 1/reciprocal function. Be careful with the ( ).

Look at #34. On your calculator you would enter: (1/4)(tan(x-(π/2)))[x^{-1}] [ENTER]. Or you could enter: (1/4)(1/(tan(x-(π/2)))) [ENTER].

#39-45: Do not do these by graphing. Using your knowledge of the unit circle, find the 2 angles that have the given trig value. These angles are from 0 to 2π. Then find the coterminal angles for these angles that are negative, and between 0 and -2π. For example, if one of your angles is π/3, then the negative coterminal angle would be -5π/3.

#47: If the graph has y-axis symmetry it is even. If it has origin symmetry it is odd.

#49b): The interval in which $f > g$ is the interval in which the graph of f is <u>above</u> the graph of g.

#51-53: Graph these together and see if they give you the same graph. If so, they are equivalent. Watch out, though, because the graph will not show the “holes” for which the function is undefined after you algebraically cancel factors in the denominator.

#59-61: Graph these on your calculator.

#63-65: Just graph these and describe the behavior of the function as x increases without bound.

#73: Use the right triangle in the picture to come up with an equation that involves x, d, and 7. Then solve that equation for d.

#75b): Describe what happens to the number of prey as the population of predators increases. Then describe what happens when the number of prey is small.

#85: The symbol "!" stands for the Factorial Function. The number $4! = 4 \cdot 3 \cdot 2 \cdot 1$, the number $7! = 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$, etc. On your calculator you can find this function at [MATH] [PRB] [!]. (The [PRB] menu is the last one across the top of the [MATH] menu options. It stands for Probability.)