Week 2 Pre-Calc Assignment:

Day 1: pp. 35-40 #1-41 odd
Day 2: pp. 35-40 #43-71 odd, 77, 85, 93, 97, 101-109 odd
Day 3: pp. 47-50 #1-37 odd
Day 4: pp. 47-50 #39-69 odd, 75, 79, 89-97 odd
Day 5: pp. 56-58 #1, 3, 9-27 odd, 31, 39, 43, 51-61 odd, 73, 75

Notes on Assignment:

Pages 35-40:

#13-21: Solve each equation for y and then test in the function machine.

#37-39: Use the [table] function on your calculator for these 2 problems. Enter the equation using [y=]. Press [tblset]. For TblStart, put the first x-value given in the table in your assignment. The ΔTbl should be 1, since the x-values go up by 1 for each entry. Press [table] and see the y-values.

#43-49: Let f(x) = 0 and solve the resulting equations for x. I would suggest factoring for the quadratic equations that you get in #47 and 49.

#51-53: Set the 2 functions equal to each other and solve for x. I would suggest factoring the quadratic equations that result.

#55-67: Remember that the domain is all of the real numbers except those for which the function is undefined for real numbers. If there is a fraction, set the denominator = 0 and solve. This tells us what x can't be. If there is a radical (even root), the radicand must not be negative, so set the radicand ≥ 0 and solve. This tells us what x can be. (Note: The radicand is the part under the radical sign.)

#61: When you set the radicand ≥ 0 and solve, you get x^2 **#** 1. This means that x is sandwiched between -1 and 1. That would be written -1 **#** x **#** 1.

#85: You will need to write the *side* in terms of the *perimeter*, then put that into the traditional area formula for a square.

#97b) Use the Pythagorean Theorem using d, h, and 3000. Then solve for d.

Pages 47-50:

#1-3: Remember that the domain is all of the values on the x-axis that are used for the graph of the function (i.e. all of the values on the x-axis that have a point above or

below them). The range is all of the values along the y-axis that are used for the graph of the function (i.e. all of the values on the y-axis that have a point to the right or left of them.)

#5-7: Estimate these values to the nearest integer.

#9-13: You can do these without printing the graphs. Just look at the graph and see if it passes or fails the vertical line test.

#15-23: Finding the zeros is the same as finding the x-intercepts. Let f(x) = 0 and solve for x. Remember that f(x) is just another way of saying y.

#21: Factor this by grouping the first 2 terms together and then the last 2 terms together. There will be a common binomial factor that you can then pull out.

#25-29: Use the CALC function ([2^{nd}][TRACE]) and then [zero]. You do <u>not</u> need to verify algebraically for these as it says to in the directions.

#31-37: A function is increasing if it is going "up hill" reading left to right. It is decreasing if it is going "down hill" reading left to right. If the function is totally flat (horizontal), we say it is constant. Do <u>not</u> include the relative min or max in the interval. Use (,) instead of [,].

#39-47a): Use [TRACE] and then the left and right arrows to find the relative minimum or maximum. This is the transition point from one type of function to another (eg. from a decreasing function to an increasing one). The x-coordinate of the min/max will be the boundary of your interval.

#43a): Use the (-) button and not the – button for the negative sign. Also, to raise a variable to an exponent, use the ^ button. So, this looks like (-) x ^ 4 on your [y=] screen.

#47a): Put the exponent in ( ) or else write it as 1.5.

#39-47b): Look at the graph of your equation. Pick an x-value to the left of the first minimum or maximum (if there is one). Press [TBLSET] ([2^{nd}][WINDOW]). Use that x-value that you just picked as your TblStart number. For the ΔTbl use 0.1. Press [TABLE] ([2^{nd}] [GRAPH]). Scroll up or down, watching how the y-values change. This is how you can determine the intervals in which the function is increasing or decreasing. If the y values are increasing as the x-values increase, then the function is increasing there. If the y values are decreasing as the x-values increase, then the function is decreasing there. Where they change from increasing to decreasing would be your relative maximum. Reverse that if you scroll up and make the x-values decrease.

#49-51: Use the CALC function ([2nd][TRACE]) and then [minimum] or [maximum]. Select the left and right boundaries as we have done for the intercepts. When it says Guess?, press [ENTER] and it should give the relative min or max.

#53-59: Graph these functions on graph paper using a table, if needed. Then look to see where $f(x) \geq 0$. In other words, where is the function on or above the x-axis?

#61-65: Check for symmetry like we did in the last lesson. Change the f(x) to a y. Then see if (-x,y) gives you an equivalent equation, which means it's symmetric with respect to the y-axis, and we call it <u>even</u>. If (-x,-y) gives you an equivalent equation then it is symmetric with respect to the origin and we call it <u>odd</u>.

#67-69: We need to take the height of the curve at x (which is $-x^2+4x-1$) and subtract the distance from the figure's bottom edge to the x-axis. (This amount is included in the $-x^2+4x-1$, but is not part of the height.)

#75a): Remember that L will be "y" on your graph. Also, you will have to adjust your window. Your x values should go from 20 to 90 (scale = 10), as given in the problem. If you calculate the value of the function at 20 and at 90, you will be able to set your window values for y. Do this by using the [CALC] [value] function.

#75b): Use the [TRACE] function. Press [TRACE] and then the left and right arrows to move the cursor to the point where y=2000. Your wattage will be the x-coordinate.

<u>Pages 56-58</u>:

#1-3: You are given 2 points. Find the slope between them and then use the slope and one point in y=mx+b to find b. Write your equation and sketch the graph.

#9-27: You may need to adjust the window using the [WINDOW] button to get a good view of the curve. You can also use the [ZOOM] button. If you choose [Zoom In], move the cursor to the center of where you want the zoomed graph and press [ENTER]. If you choose [ZBox] you will need to move the cursor to the corner of a box that you are going to make around the area that you want to enlarge. Press [ENTER] to set that corner. Then use the arrows to set the opposite corner of the box. You will see the box forming on the screen as you press the arrows. When the box is the size you want it, press [ENTER] and that box will be zoomed in on.

#31: A note about the Greatest Integer Function. Picture where the number would be along the x-axis. Then for the greatest integer of that number, you choose the integer that is immediately on the <u>left</u>. That makes sense for the positive numbers. For example, the greatest integer of 3.7 should be 3. But for a negative number it seems a little weird. For example, the greatest integer of -7.8 is -8. You can't choose -7 because -7 is greater than -7.8. For #31, an example would be finding h(-7.3). We get $h(-7.3) = [-7.3+3] = [-4.3] = -5$.

#39: When you put a number into the greatest integer function, you get the integer itself if what you put in is an integer. If it is a fraction or decimal number, what you get is the integer that would be just to the left of that number on the number line. Greatest integer functions are always step functions of some sort, though the steps may be slanted.

#43: You can do this one of 2 ways. One way would be to make 2 separate tables, using values in each domain for the x's. Or, since these are both linear equations that can easily be graphed using y=mx+b, you can draw the graph of both lines, and then erase the part that should not be included, based on the domains.

#51: Remember that the Greatest Integer Function is found in the [MATH] menu. Press [MATH]. Use the right arrow to highlight NUM. Then choose [int] (option 5). This is the Greatest Integer Function. Be sure to close your parentheses correctly.

#53-61: All I want you to do is write the equation of the common function. (See the list on page 55.)