Week 5 Pre-Calc Assignment:

Day 1: pp. 116-120 #1-7 odd, 11-39 odd
Day 2: pp. 116-120 #43-49 odd, 53-59 odd, 77, 79, 83, 93
Day 3: pp. 130-133 #1-65 odd
Day 4: pp. 130-133 #67-95 odd, 97a-f, 99-115 odd

Notes on Assignment:

Pages 116-120:

#13-27: To find the vertex you will need to put the function in vertex form $f(x)=a(x-h)^2+k$. You will have to use Completing the Square to put these in vertex form. Refer to your notes or the overhead masters if you get stuck. If there is a coefficient on the x^2 term other than 1, be careful as you pull it out. Check your math by multiplying back using the Distributive Property. Then to find the x-intercepts, put the equation in factored form $f(x) = (x+n)(x+m)$ and set it equal to zero. If it does not factor (or if you just prefer it) you can use the quadratic formula.

#13-15: These will be easier to do by thinking of transformations instead of putting them in vertex form.

#17: This is in vertex form already, but you will have to multiply it out and factor it to find the x-intercepts (or use the quadratic formula).

#27: As you factor out the ¼, be careful on what you put as the coefficient of x. Ask yourself "What times ¼ will give me -2?"

#29, 35: When you complete the square on these, clear the parentheses before you start.

#37-39: These are rigid transformations, so just look at the shifts and reflections.

#41: This one is also a vertical stretch. Figure out from the graph how much each value y-value of the standard equation $y = x^2$ has been multiplied by. This is your leading coefficient.

#43: Since we know the vertex is (-2, 5), we know our equation must look like $f(x) = a(x+2)^2 +5$. Since we know that it must go through (0, 9), we can put those values in the equation and get $9 = a(0+2)^2 +5$. Now solve for *a* and put it back into $f(x) = a(x+2)^2 +5$.

#45-49: Do the same as in #43.

#53-55: When finding the x-intercepts algebraically, you will most likely want to solve by factoring.

#57-59: You are to find the x-intercepts using your calculator, and then find them algebraically, as you did in #53-55.

#77, 79: When model equations are quadratics, they will be a parabola in shape. That means that they will have a minimum (if the parabola opens upward) or they will have a maximum (if the parabola opens downward). When finding the min or max, you only need the vertex. Use the formula for finding the vertex on the top of page 115. Find the x-coordinate first, and then put that value into your function to find the corresponding y-coordinate. These coordinates will be for the vertex, which is your either your minimum or maximum point (depending on whether the parabola opens up or opens down).

#83: This is similar to the min/max problems above. For part (c), remember that the ground is the "x-axis." If a ball hits the ground, then it's hitting the x-axis, and y must = 0.

<u>Pages 130-133</u>:

#9-11: If it is a nonrigid transformation, put in a couple of x-values to get a couple of points.

#27-41: Let f(x) = 0 and solve. All will factor at least partially. You will need to use the quadratic equation for #33.

#43-45: Use the graphing calculator to give you a visual clue on the zeros, but find them algebraically as you did for #27-41.

#47-55: Look at the process for finding zeros algebraically and then reverse it for these problems. (For example, in #47 you start with (x-0)(x-10) = f(x).)

#57-65: Use the same process as you did in #47-55, only you will have to use multiplicity to get the degree asked for (For example, in #57 you will need (x+2)(x+2) = f(x) to get a polynomial of degree 2.)

#67-79: All of these will factor except #69. (See notes for #69.)

#69: When you set f(x) = 0 you get no solution because the graph does not cross the x-axis. Because it is a quadratic, you will need to use completing the square to put the function in a form that you can graph more accurately and easily.

#85-87: Enter the equation into [y=]. Graph it to get a visual idea of where the zeros are. In [TBLSET] use a value just to the left of where you saw the graph cross the x-axis as your [TblStart] value. Find the intervals using Δtbl = 1. Write the intervals.

Then adjust your [TblStart] to the left edge of one of your intervals and change the Δtbl to 0.1 or smaller to get a closer approximation of the zeros. Repeat for any other intervals.

#89a): Use V=LWH to verify.

#89b): Remember that the length and width must be positive.

#89c): Make a table on the calculator and look for the maximum value for the volume (which is y on your calculator equation).

#91b): The tree is growing most rapidly when the slope of your curve is the steepest.