How to Use some Basic Functions on your Graphing Calculator

I will discuss how do work with some basic functions on the TI-86 on this sheet. These can be done on the TI-83, but the keystrokes are not exactly the same. *(If anyone is willing to lend me a TI-83 for a weekend, I can create a similar sheet for the TI-83).*

Even though this looks like a lot of steps, after you have done it a few times, you will see that these are relatively quick processes.

I. Finding Roots/Zeros on the calculator.

Suppose we want to find the roots of $f(x) = x^2 - 8x - 6$

- Push the GRAPH key, and then select F1, which should say $y(x) =$
- Enter in $x^2 - 8x - 6$ where you see $y1 =$
- Hit 2nd (the yellow key) then F5 (GRAPH)
- You should get a graph of the function on your screen.
- If you don't, select F3 (ZOOM) then F4 (ZSTD). This will take the graph back to its standard viewing window. If you do this, push EXIT, to get you back to the main graph menu.
- The main graph menu should have $y(x) =$ at F1 and GRAPH> at F5.
- Looking at the graph, you can see that there is a root near –1 and one between 8 and 9 (on the *x*-axis).
- Select MORE (next to EXIT key). Your menu at the bottom of the screen should change.
- Select F1 (MATH). Your menu should look different again.
- Select F1 (ROOT). It now asks "Left Bound?"
- Move your cursor, so that it is to the left of the root near –1. The cursor should be above the *x*-axis. Push ENTER. It now asks "Right Bound?"
- Move the cursor to the right of the root (so the cursor is below the *x*-axis). Push ENTER. It should now say "Guess?".
- Push ENTER again. You should get *x*=-.6904157598. This is your root.
- Repeat this process for the root between 8 and 9. You should get a root of 8.6904157598

II. Finding Maximums/Minimums on the calculator.

Suppose we want to find the minimum point of $f(x) = x^2 - 8x - 6$

- Push the GRAPH key, and then select F1, which should say $y(x) =$
- Enter in $x^2 - 8x - 6$ where you see $y1 =$
- Hit 2nd (the yellow key) then F5 (GRAPH)
- You should get a graph of the function on your screen.

- If you don't, select F3 (ZOOM) then F4 (ZSTD). This will take the graph back to its standard viewing window. If you do this, push EXIT, to get you back to the main graph menu.
- To see the graph better, you will need to zoom out. To do this, select F3 (ZOOM) then F3 (ZOUT), then push ENTER. This will give you a better view of the graph.
- To find the minimum value, push GRAPH, then push MORE (right below the F3 key).
- You will now see a list of options, select F1 (MATH) then select F4 (FMIN). This is the key needed to find the minimum value of the function. FMAX would be used if you were looking for a maximum.
- The calculator now asks "Left Bound?"
- Using the left or right arrow keys, move your cursor, so that it is to the left of the minimum point. Push ENTER. It now asks "Right Bound?"
- Move the cursor to the right of the minimum point. Push ENTER. It should now say "Guess?".
- Push ENTER again. You should get x=4 and y=-22. This is the minimum point of the function.

III. Finding the Intersection point(s) of two curves on the calculator.

Suppose we want to find the intersection points of $f(x) = x^2 - 8x - 6$ and $g(x) = 2x + 3$

- Push the GRAPH key, and then select F1, which should say $y(x) =$
- Enter in $x^2 - 8x - 6$ where you see $y1 =$ and $2x + 3$ where you see $y2 =$
- Hit 2nd (the yellow key) then F5 (GRAPH)
- You should see graphs of both of the functions on your screen.
- It is good to see where the graphs intersect. Use ZOOM or WIND (window) to adjust the screen, so you can see both intersection points. *This often takes a few tries.*
- You should see two intersection points. One near the origin in Quadrant II and one not so close to the origin in Quadrant I.
- To find the intersection point in Quadrant I, Select MORE, then FI (MATH).
- Select MORE again, and then F3 (ISECT)
- It should ask "First Curve?"
- Move the cursor, so that is it near the intersection point. Push ENTER.
- It now asks "Second Curve?" Push ENTER.
- It now asks "Guess?" Push ENTER one more time.
- It now tells us that the intersection point is approximately at x=10.83095 and y=24.66190.
- Repeat this process to find the other intersection point, which is approximately at x=-.83095 and y=1.33809