

TI-83 Instructions: Value, Minimum, Maximum, and Zero

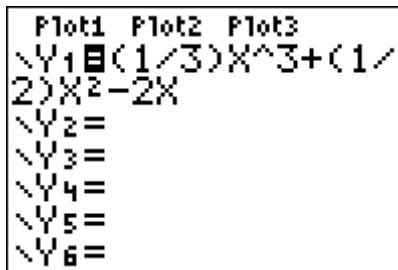
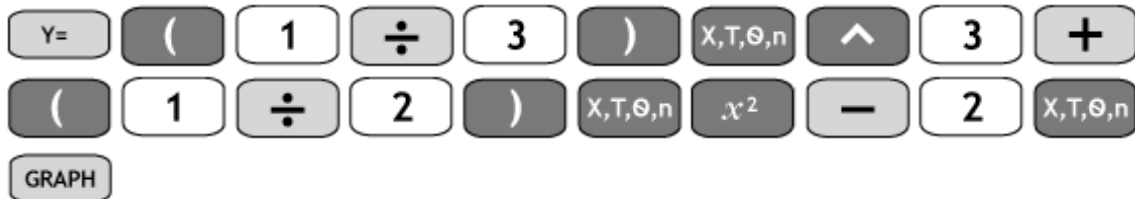
The following handout will demonstrate how to find a value, minimum, maximum or zero, on a TI-83 graphing calculator. These instructions work for other version of graphing calculators, but not all (refer to your manual if they do not apply to your specific calculator).

For these instructions, I will use the function: $f(x) = \frac{1}{3}x^3 + \frac{1}{2}x^2 - 2x$

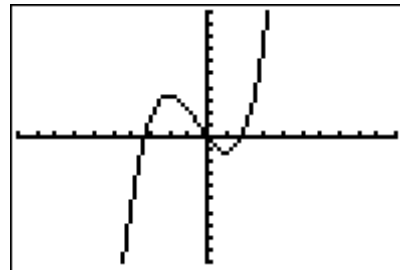
Putting the equation into the calculator:

Put the function into any Y. Make sure to include parenthesis where necessary. Your graph will vary depending on your viewing window. To get a good window, proceed to the next step

Button Instructions



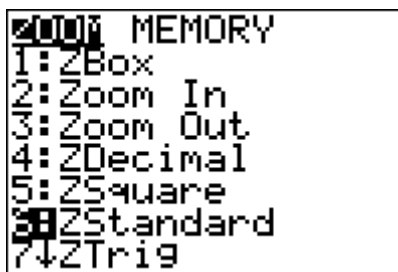
Your equation should look like this.



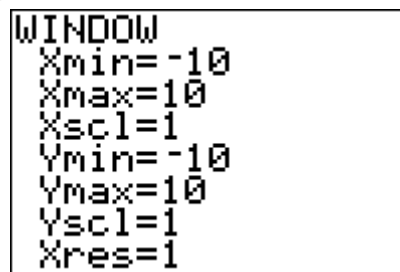
This is what your graph should look like (but you may have to adjust the window)

Getting a standard window:

To view the standard window $[-10,10,1]$ by $[-10,10,1]$, just open your zoom window and select “ZStandard” by highlighting it (by using your down arrows) and pressing enter, or simply pressing “6”.



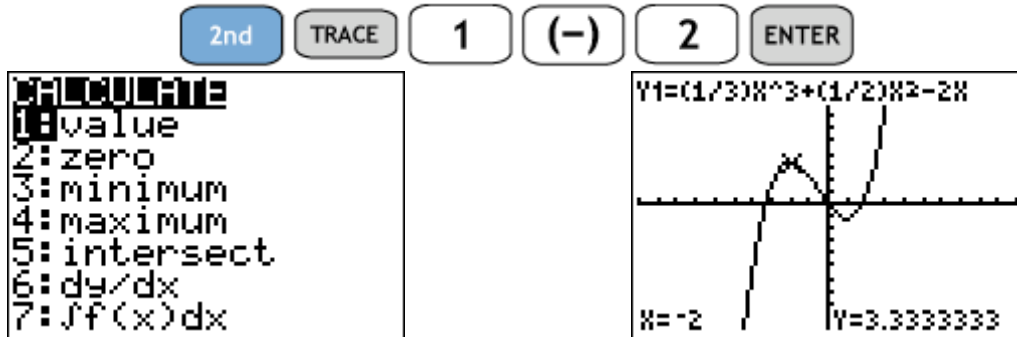
The zoom window



This is what the standard window looks like

Finding a value (evaluating a function at a particular value of x):

If you want to evaluate the function when $x = -2$, open the calculate menu and choose “value”. Next enter the value of x , followed by “enter”.



Calculate menu

Note that $f(-2) \approx 3.33$

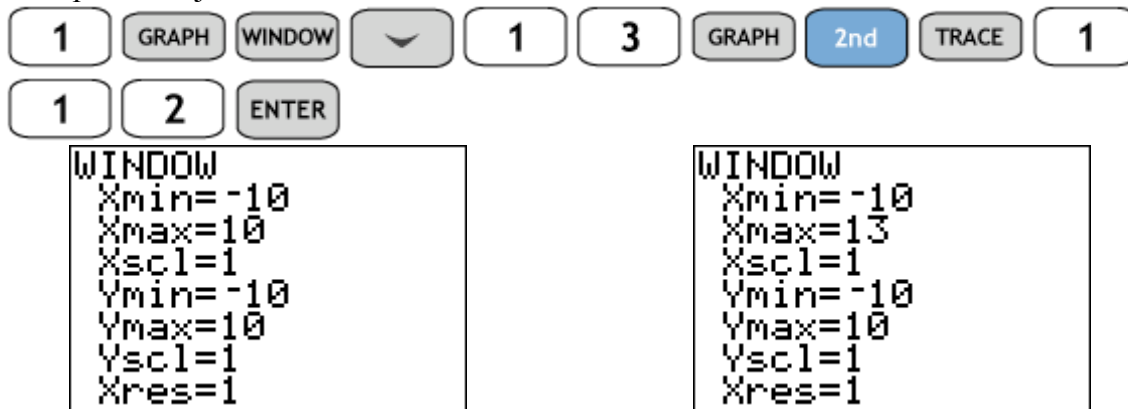
Follow the same steps to evaluate 12. However, this time you will get an error (see picture). This means that this value of x is not in your domain. So you must change your window.



Error window

Adjusting the window:

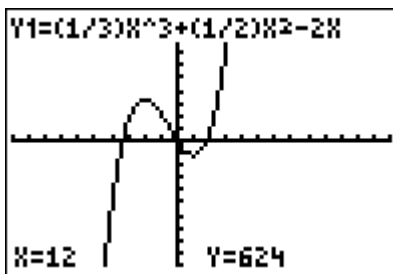
“Quit” and open the window menu. Adjust the window to include the value. For this example I will just increase the “Xmax” to 13.



The standard window

The adjusted window

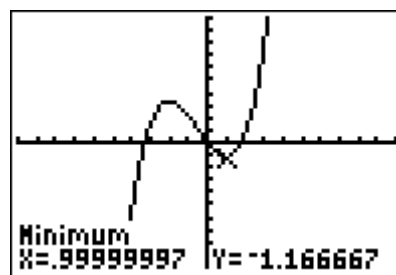
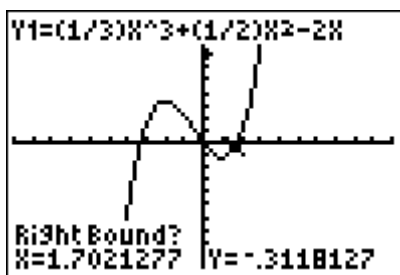
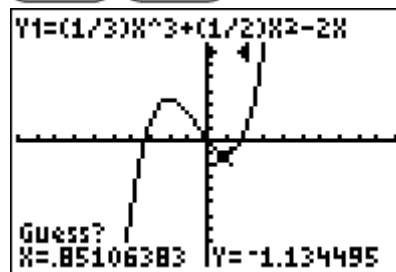
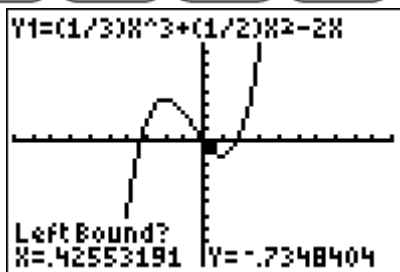
Once you have corrected this try to evaluate 12 again. This time you should get an answer.



$$f(x) = 624$$

Finding a minimum:

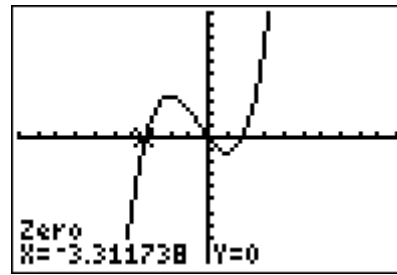
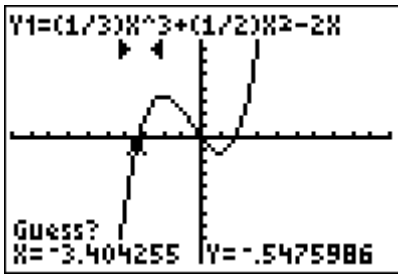
To find a minimum point open your calculate screen again and select “minimum”. Then follow the directions. It will ask you for a “Left Bound” (so just hit enter anywhere to the left of the minimum you are trying to find) and then for a “Right Bound” (select a point to the right of the minimum). Finally the calculator will ask that you “Guess”. Just select a point that is approximately the minimum point (get as close as you can get). You may need to arrow over more or less than I have.



So the minimum is $(1, -1.167)$

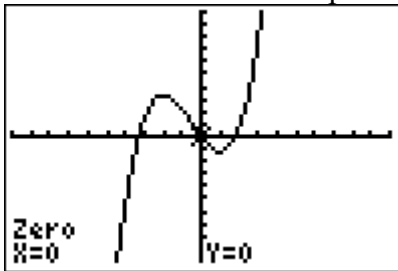
Finding a maximum:

Open the calculate menu once again and select “maximum”. Then follow the instruction (they are the same as when finding a minimum). You may need to arrow over more or less than me to find appropriate points.

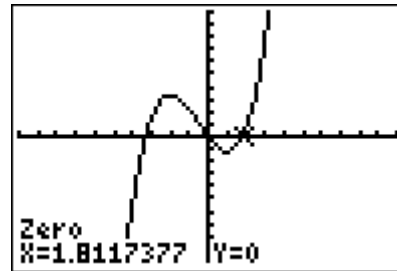


So the zero here is $x \approx -3.312$

You can follow these same steps to obtain the other two zeros:



$x = 0$



$x \approx 1.812$