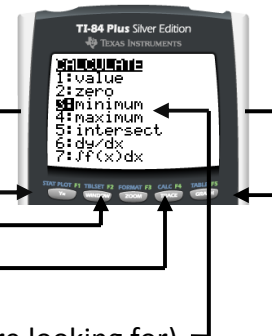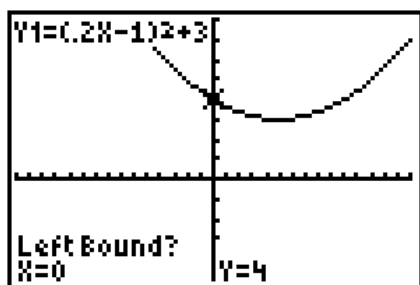# Min/Max with a TI-83 or TI-84

How To Start:

1. Graph the function.

2. Change your viewing window if needed.

3. Be sure that the min/max is visible on screen.

4. Press the 2nd, TRACE (the CALC option).

5. Choose 3: minimum or 4: maximum (whichever you are looking for).

What to do once you have requested 3: minimum or 4: maximum:

Left Bound? – The calculator is requesting that you make sure the blinking crosshair is somewhere to the left of the min/max point. Use the left/right arrow keys and press enter when it is.

Right Bound? – The calculator is requesting that you make sure the blinking crosshair is somewhere to the right of the min/max point. Use the left/right arrow keys and press enter when it is.

Guess? - The calculator is asking you to place the blinking crosshair somewhere close to where the actual min/max point is located. This is especially important if there happens to be more than one max/min point.

WARNING – Decimals: Sometimes the min/max calculations on the calculator can be off by very small amounts. For example, in the graph shown above, the calculator gives a minimum point of (5.0000016, 3). In reality the vertex on this parabola is the point (5, 3). Be wise in your solutions.

Time to practice… Graph the following on your calculator, find a good viewing window, and then find all minimums and maximums for the graph.

1. $y = -x^2 - 8x - 18$
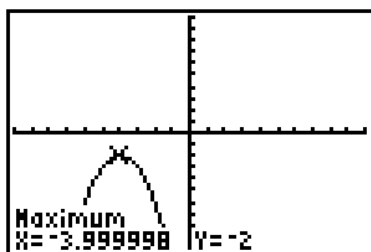2. $y = \dfrac{e^x}{x}$
3. $y = x^3 + 6x^2 - 3x + 5$
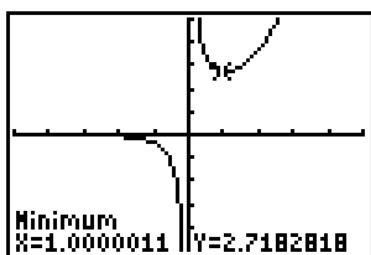
Min/Max with a TI-83 or TI-84
ANSWER KEY

1. -

*<u>Note</u>: The calculator may read (-3.999998, -2) but the actual coordinate for the maximum point is (-4, -2)

Maximum
X=-3.999998 Y=-2

2. -

* <u>Note</u>: Again, it appears that (1.0000011, 2.7182818) is the minimum point. You should understand that the x-coordinate is really 1 and the y-coordinate should look familiar. Indeed the correct coordinate is (1, e)

Minimum
X=1.0000011 Y=2.7182818

3. -
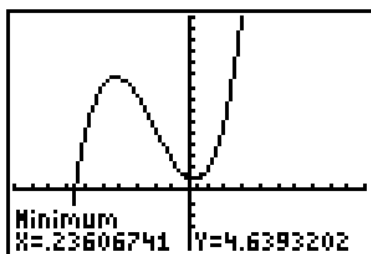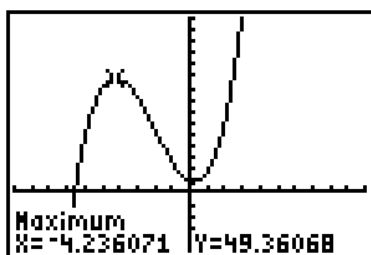
* <u>Note</u>: Since this is a cubic function, you should have guessed that there is one minimum and one maximum on the graph. The minimum is the point (0.23606741, 4.6393202) and the maximum is the point (-4.236071, 49.36068).

Maximum
X=-4.236071 Y=49.36068

Minimum
X=.23606741 Y=4.6393202

WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-25
Ymax=75
Yscl=5
Xres=1