

# TI-83, 84 Calculator Procedures

## General Points:

- The TI shows the entire entry on the screen at once. This makes correcting mistakes easier; you just use the arrow keys to go back and forth through what you input. Use the **DEL** and **INS** keys to delete/insert.
- If you input a long problem into the calculator and hit enter, only to see you made one little mistake somewhere, you can hit **2<sup>nd</sup> Enter (Entry)**. That will bring back up the entire expression you input and you can use the arrow keys to make corrections. Repeatedly hitting **2<sup>nd</sup> Enter** will bring up older inputs.
- If you wanted to input something like  $\frac{4-3*2}{8-7(3-5)}$ , it would have to be input as  $(4-3*2) \div (8-7*(3-5))$ , with parentheses around both the numerator and the denominator. The calculator needs to be told what is on top and what is on the bottom since it cannot see the bar. This will come up frequently in this class.
- The **ANS** key, which is above the (-) key next to the **ENTER** key, is temporary memory. If you input  $8 - 2*1.2$ , the answer will of course be **5.6**. Then, **ANS** will hold the value **5.6**. If you hit **2<sup>nd</sup>, x<sup>2</sup>, ANS**, you will get the square root of **5.6**, the **ANS**wer to  $8 - 2*1.2$ . Then **ANS** has the value **2.366431913**. This is a big help when your answers are decimals and you don't want to and should not round these numbers to be used in later formulas. The **ANS** key **ONLY** holds the last thing the calculator calculated.
- If you calculate something and then need to use that answer in some other expression, you can use the **STO>** button to **STO**re that number in memory. For example,  $(2-5.63)^4$  is 173.6306936 (^ is your exponent button, "^^" means "to the" power). You can then hit **STO>** (which is right above the **ON** button), **X** (which is right next to the green **ALPHA** button). On screen you will see **Ans→X**. So, it put the last answer into the variable **X**. You can then type  $X \div 5$  and get 34.72613872, which is  $173.6306936 \div 5$ .

## A. Graphing Basics.

1. Hit the **Y=** button, which is in the upper left hand corner.
  - \*If there is old information in there, use the **CLEAR** button, below the arrow keys, to clear it out.
  - \*If the lists have weird variables in them, hit **MODE** (next to **2<sup>nd</sup>** button), and make sure the fourth line down has **FUNC** highlighted (for **FUN**Ction.)
2. Enter your function into **Y<sub>1</sub>** (if you have more than one function, put them into the other spots.)
  - \*The button you use to put the **X** variable in is the **X,T,θ,n** button next to the green or yellow **ALPHA** button.
3. Once the information is entered, hit the **GRAPH** button in the upper right hand corner.

## B. Changing the window.

1. When you graph a function, the standard window shows from -10 to 10 on both axes.
  - \*If the window has changed and you want to get back to the standard window, hit **ZOOM** (middle of top row) and pick number **6: Zstandard**.
2. If the standard window is not good enough, meaning you can't see what you want or maybe you can't even see anything, then you can use **WINDOW**, next to the **ZOOM** button.
  - \*Hit **WINDOW**. You can change the lower (**Xmin**, **Ymin**) and upper (**Xmax**, **Ymax**) limits on the x and y axes here. For example, if you want to see further up, increase **Ymax**.
3. You can also do a few things in **ZOOM** to see different parts of the graph.
  - \* **2: Zoom In** and **3: Zoom out** do exactly what it sounds like they do.
  - \* **1: ZBox** lets you open a box around any part of the graph and it will zoom in on that area.
  - \* **0: ZoomFit**, way at the bottom of the list, attempts to fit the graph into the window. Sometimes works well.

### C. Finding the intersection of two functions.

1. Put one function into **Y<sub>1</sub>** and the other one into **Y<sub>2</sub>**. Make sure both equals signs are highlighted.
2. Hit **GRAPH**. Make sure you can see the intersection. (See **B. Changing the Window** if you can't.)
3. Hit **2<sup>nd</sup> TRACE**, next to the **GRAPH** button, to get to **CALC**.
4. Incredibly enough, we want **5: intersect** to find the intersection. Select that.
5. It will ask you three questions. **First Curve, Second Curve, Guess?** If you have only two functions in the lists, when you hit enter for the first curve, it will jump down to the other function and you can then just hit enter for that one. For **Guess?**, move the cursor as close to the intersection as you can and hit **ENTER**.
6. It will then display the X and Y pieces of the answer at the bottom of the screen.

### D. Finding min and max (vertex for parabolas).

1. Put the function into **Y=**.
2. Hit **GRAPH**. Make sure you can see the max or min. (See **B. Changing the Window** if you can't.)
3. Hit **2<sup>nd</sup> TRACE**, next to the **GRAPH** button, to get to **CALC**.
4. Incredibly enough, we want **3:minimum** or **4:maximum**. Select the appropriate one.
5. It will ask you three questions.
  - i. **Left Bound?** This is related to the X-axis. Move the cursor to the x-value that is to the left of the answer.
  - ii. **Right Bound?** Now move the cursor to the right, make sure to go a bit more over from the answer.
  - iii. **Guess?** Yup, put the cursor right on top of the answer. It will display the point at the bottom.

### E. Using the table.

1. If you have functions in the list, hit **2<sup>nd</sup>, GRAPH** to get to **TABLE**.
2. You should see the XY table for the functions you have input.
3. Move up and down using the arrow buttons.
4. Control the starting x-value and the *steps* (the distance between x-values) using **TBLSET**, which is above the **WINDOW** button.
  - \***TblStart** controls what value of x shows first on the list.
  - \***ΔTbl** controls the change in the x-values. If you want to see the outputs for 1, 1.5, 2, 2.5 ... you would set **TblStart** at 1 and **ΔTbl** = .5
5. You generally want **Indpnt** and **Depend** set to **AUTO**. If you change **Indpnt** to **ASK**, then you can plug in ANY x-value you want into the table and it will spit out the output y-value.

### F. General Troubleshooting.

1. Generally, you want every single item under **FORMAT** (above the **ZOOM** button) set to the left choice. **RectGC**, **CoordOn**, so forth. Some graphing weirdness might happen if this is not true.
2. If you get **ERR: DIM MISMATCH**, then hit **ENTER** and hit **2<sup>nd</sup>, Y=** to get to **STAT PLOT**. Select **4: PlotsOff**, hit **ENTER**, **ENTER**. Should take care of it.
3. If you get **ERR: WINDOW RANGE**, then you've done something like set **Xmin=10** and **Xmax=10** in the **WINDOW**. This makes no sense, of course. It gives no room for the x-axis!
4. Other things? Come see me.