Displaying Data on a Graphing Calculator

Thanks to Dr. Dale Winter, the previous Director of Service Mathematics, for this supplement.

**Entering Data into a TI-83 Plus**

The purpose of this first section is to show you the steps in entering a table of numbers into a graphing calculator. It is a good idea for you to follow along with the instructions given here on your own calculator.

In this demonstration we will enter the values from Table 1 (below), using “year” as the input and “percentage” as the output.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Percentage</td>
<td>60.1</td>
<td>58.9</td>
<td>55.8</td>
<td>52.9</td>
<td>50.4</td>
</tr>
</tbody>
</table>

Table 1: Percentage of high school seniors who see “great risk” in trying heroin once or twice.

The steps involved in entering this data into a TI-83 Plus are shown below.

(a) After you turn your calculator on, you will see the MAIN SCREEN. Press [STAT].

(b) You should get a screen that looks like this. Press [ENTER].

(c) There may already be some data stored in the calculator. You will need to clear this. (See next section.)

(d) This is what your screen should look like when you have cleared all of the data.

(e) Make sure that the dark cursor is under L1 and type the first input value (1975).

(f) Press [ENTER] to enter the input value.

(g) Type in each input value in Table 1, pressing [ENTER] after you have typed each value.

(h) Press the right arrow on your calculator so that the dark cursor is below L2.

(i) Type the first output value from the Table 1 into your calculator.

(j) Press [ENTER] to enter the value.

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1 If you don’t have a TI-83 Plus, then the procedures for entering and displaying data may be different. Consult the Owners’ Manual for your calculator for the specific procedures to follow.
Clearing Data from Lists on a TI-83 Plus

If you want to enter and display new data on your calculator, you may find that there is some old data already there. Although it is possible to over-write the old data, it is usually best to clear the old data before entering the new.

- **(a)** Begin by pressing [STAT] followed by [ENTER] to access the old data.
- **(b)** Press the up arrow on your calculator so that the cursor is over L1.
- **(c)** Press the [CLEAR] key. The line at the very bottom of the screen will clear.
- **(d)** Press the [ENTER] key. All of the data stored in L1 will be cleared.
- **(e)** Press the right arrow followed by the up arrow so that the cursor is over L2.
- **(f)** Press the [CLEAR] key. The line at the very bottom of the screen will clear.
- **(g)** Press the [ENTER] key. All of the data stored in L2 will be cleared.

2 If you try to make a graph or a STATPLOT on your calculator and the calculator produces a message that says: “ERROR: DIM MISMATCH” the reason is almost always because you have erroneously left some old data in the calculator.
Editing and Correcting your Data on a TI-83 Plus

Sometimes you might find that you have entered one of the data values incorrectly and you need to go back and correct it. The procedure for doing this on a TI-83 is shown below.

(a) The third value in L2 has been entered incorrectly.
(b) Use the up arrow to move the cursor over the incorrect value.
(c) Type the correct value. The value that you type will only appear at the bottom of the screen.
(d) Press [ENTER] to enter the correct value into L2. The correct value will appear in L2 now.
(e) Press [2nd] followed by [MODE] to quite out of data entry and return to the MAIN SCREEN.

Setting up a STATPLOT on a TI-83 Plus

You can use your calculator to display a graph showing the numerical data that you have entered. On a TI-83 Plus this kind of graph is called a STATPLOT and needs to be activated on the calculator.

Once you have entered the data, the steps involved in activating a STATPLOT are shown below.

(a) Begin at the MAIN SCREEN on your calculator.
(b) Press the [2nd] key followed by the blue [Y=] key. This will bring you to the STAT PLOTS screen.
(c) Press [ENTER] to select Plot 1.
(d) Using the left and right arrow keys, move the flashing cursor so that it is over the word "On". Press [ENTER].
(e) Press [2nd] followed by [MODE] to quite out of STAT PLOTS and return to the MAIN SCREEN.

Displaying a STATPLOT on a TI-83 Plus

Once you have turned the STATPLOT on, you are ready to display the graph showing your data points on the screen of your calculator. If you simply press the [GRAPH] button on your calculator, you will probably by rewarded with a picture like the one shown on the next page.
which does not show any of the data points that you have entered. The problem here is that the size of the calculator’s viewing window is not set to display values as large as the ones that you have entered.

The Viewing Window

If your calculator screen is blank with a pair of coordinate axes in the middle then you are looking at the TI-83’s idea of a standard sized graphing window. Press the [WINDOW] button and your screen will resemble the one shown below.

The correspondence between these numbers and the numbers that you would put on a set of coordinate axes if you were drawing a graph by hand is shown in the diagram below.

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3 The Xres and Yres settings are not very important for most of the graphs that we will make in Math 112 and 122, so we will ignore these settings during the course.
Modifying the Viewing Window

When you are displaying data (or graphing an equation later in the course) on a calculator it is best to set the viewing window so that you can see all of the relevant patterns and trends in the data.

For example, if you look at the numbers that are contained in Table 1:

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Table 1: Percentage of high school seniors who see “great risk” in trying heroin once or twice.

then the range of “inputs” or “x-values” that will display all of the points in Table 1 is from \( x = 1975 \) to \( x = 1979 \). The range of “outputs” or “y-values” that will display all of the points in Table 1 is \( y = 50.4 \) to \( y = 60.1 \). These ranges are very different from the standard ones assumed by the TI-83, which is why simply pressing the [GRAPH] button did not show any of the data points that had been entered into the calculator.

The steps involved in changing the size of the viewing window on a TI-83 are shown below. When you have completed them, press the [GRAPH] button with these new window settings and you should see a picture that resembles (e) below.

(a) Start on your calculator’s MAIN SCREEN.
(b) Press the [WINDOW] button.
(c) Type in the value that you want to use for Xmin and press [ENTER].
(d) Work your way down the list enter the viewing window values that you want.
(e) When you have entered the values for the viewing window, press [GRAPH].

Automatic Window Set-Up for STATPLOTS: ZoomStat

If you are trying to display a STATPLOT but are not sure which values to use for Xmin, Xmax, Ymin and Ymax, then you can let the TI-83 make the decision for you.

Instead of entering the values for the viewing window, press the [ZOOM] button and use the arrow keys to move down to option 9 (“ZoomStat”) then the calculator will take a look at your data and set up a decent-sized window for you. The steps involved and results of using ZoomStat with the data from Table 1 are shown below.
### Turning Off a STATPLOT on a TI-83 Plus

When you have finished looking at a STATPLOT on a TI-83 Plus, you may want to remove it from the screen so that you can graph other sets of data or produce graphs from formulas. The steps involved in turning off a STATPLOT are shown below.

<table>
<thead>
<tr>
<th>(a) Start on your calculator’s MAIN SCREEN.</th>
<th>(b) Press the [ZOOM] button.</th>
<th>(c) Use the down arrow button to move down to option 9. Press [ENTER].</th>
<th>(d) The calculator will automatically switch the the graph and display the data.</th>
<th>(e) If you now press the [WINDOW] button, you can see the window settings.</th>
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### Turning Off a STATPLOT on a TI-83 Plus

When you have finished looking at a STATPLOT on a TI-83 Plus, you may want to remove it from the screen so that you can graph other sets of data or produce graphs from formulas. The steps involved in turning off a STATPLOT are shown below.

| (a) Start on your calculator’s MAIN SCREEN. | (b) Press [2nd] followed by [Y=] to access the STAT PLOTS screen. | (c) Press [ENTER] to access Plot 1. | (d) Use the right arrow to move the flashing cursor so that it covers “Off”. Press [ENTER]. | (e) Press [2nd] followed by [MODE] to return to the MAIN SCREEN. |