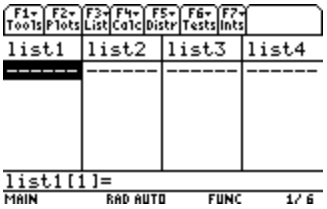
Precalculus: Section 1.7
Scatter Plots and Linear Regression on the TI-89 Calculator

The following is a reference sheet on graphing scatter plots and calculating linear regression on the TI-89 calculator. Keep this sheet, because we will come back to this process at the end of chapter 2 and chapter 3, and potentially other times during the year.

<u>To Graph a Scatter Plot</u>:

In order to graph a scatter plot, you first must input the desired data into your calculator. To do this, press the APPS button. App icons are listed in alphabetical order, find the Stats/List Editor and select it. A Folder Selection for Statistics Application window might pop up, if it does, just hit ENTER. You should now see a screen like the one below

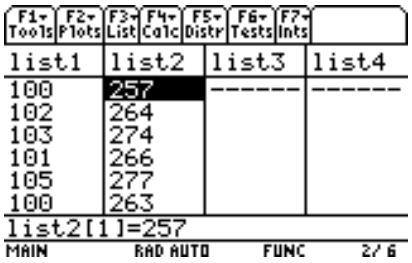


This is where you will enter the data to be plotted (into list1 and list2).

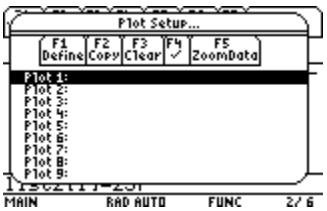
As an example for you to follow, I am going to use the following data.

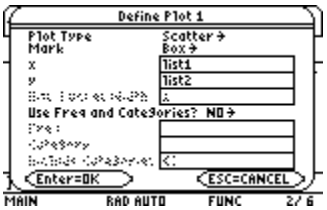
Club-Head Speed (mph)	Distance (yards)
100	257
102	264
103	274
101	266
105	277
100	263
99	258
105	275

Enter the club-head speed data in list 1 (L1) and the distance in list 2 (L2). Your completed data entry screen should look like this.



To set up your scatter plot, select F2 Plots, then choose 1: Plot Setup… You should see a screen like the one below (top picture):

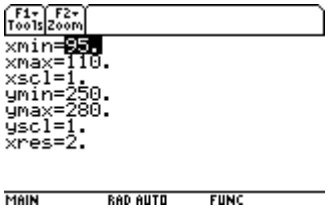




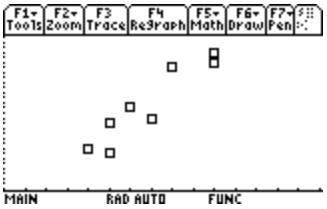
On this screen, choose F1 Define, another window will pop up to Define Plot 1. Leave the Plot Type as Scatter. You can change the Mark to whatever you want them to look like on the plot that you see. In the box across from x, enter list1. You can find this under VAR-LINK (2^{nd} -). Across from y, enter list2 (also under VAR-LINK). You don't need to enter or change anything else. There is a screen shot to the left (bottom picture). Hit ENTER (possibly a few times) until it takes you back to the Plot Setup screen. You should now see that Plot 1 is defined.

Press Y= to return to the function definition screen. At this time, clear out any functions you have entered here. DO NOT clear Plot 1.

Before actually graphing the data, we should stop and think about a good window to view it in. If we just graph it in the standard window ($-10 \leq x \leq 10;\ -10 \leq y \leq 10$) we won't be able to see any of the points, so we need to pick a better window. The optimal window will change from problem to problem depending on the data set. For our example, our *x*-values correspond to club-head speed. Those values go from 99 to 105, so we need to set the *x* window so that we can see them. Our *y*-values range from 257 to 277, so you need to adjust the window accordingly. Below is the window that I used.



Finally, press GRAPH and you should see a picture of your scatter plot.

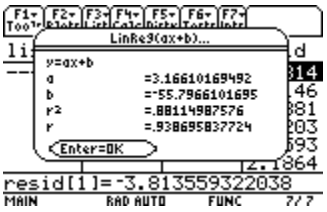


<u>To Calculate a Regression Line</u>:

Again, in your APPS menu, choose the Stats/List Editor. This should take you to the screen where you can see the data you entered to draw your scatter plot. Choose F4 Calc and then select #3: Regressions. There are several different types of regression available in this menu. We are going to be using linear regression. You will notice that both #1 and #2 say LinReg (linear regression). Either one will work, but I would use #2: LinReg (ax+b) since it is in the order that we are used to working with. The following window will pop up.

You will need to enter list1 as your X List as before and list2 as your Y List. Where is says Store RegEqn to: choose y1 (x). Nothing else needs to be changed. When your screen looks like the one below, hit ENTER once. If you hit enter multiple times, your solution screen will show up and disappear before you can look at it.

You should now see the following



Keep in mind that a is the slope (what we have called m) and b is the y-intercept, which thankfully, we have also called b. Thus our regression equation is $y = 3.166x - 55.797$. The correlation coefficient is $r = .94$.