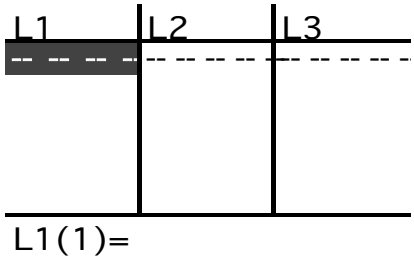
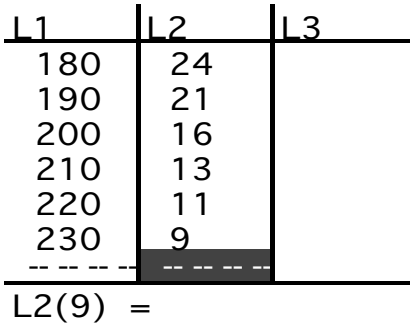
The following is a tutorial on how to do linear regressions on a TI-83 Plus. The process should be the same or very similar on a TI-84. On a TI-85 or 86 it should also be similar, but the commands will most likely have slightly different names and be located in different locations.

Graphing a Scatter Plot

In order to graph a scatter plot, you first must input the desired data into your calculator. To do this, press the **STAT** button. You will get a list of options, the first one of which should say 1:Edit… , press **ENTER** to select it. You will get the following table:

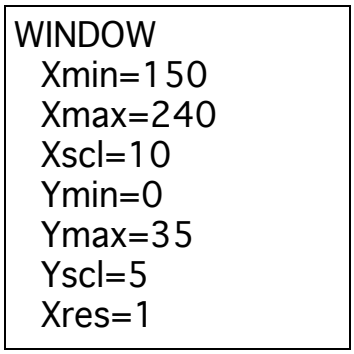


This is where you will enter the data to be plotted (into L1 and L2). Since we know what the answer is to the viscosity example in the book, we should use this as an example/tutorial. The table of values is on page 42 of the textbook. Enter the temperature column under L1, and the viscosity column under L2, by typing 160 **ENTER**, 170 **ENTER**, etc. then using the arrow keys to move between columns. When you are finished entering the data, your screen should appear as follows:



Now, to actually plot the data, press **2nd** **STAT PLOT** (actually the **Y=** key) and then **ENTER** to select the first item. Make sure that On is selected (it should be highlighted). For Type: you want to select the first (leftmost) option. Next you want set Xlist to L1. Do this by scrolling down to Xlist and pressing **2nd** **L 1** (the **1** key). In the same manner, set Ylist to L2. Lastly, select the leftmost Mark.
Press **Y=** to return to the function definition screen. On this screen you should see Plot1 highlighted. Turn off any functions that are entered here (move the cursor over the = and press **ENTER**) For example: \Y1=2X+1 is on while \Y1=2X+1 is off. Before actually graphing the data, we should stop and think about a good window to view it in. If we just

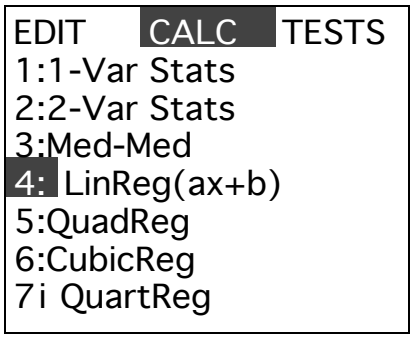
graph it in the standard window (-10<x<10, -10<y<10) we won't be able to see any of the points, so we need to pick a better window. I suggest trying the following window: (press **WINDOW**)



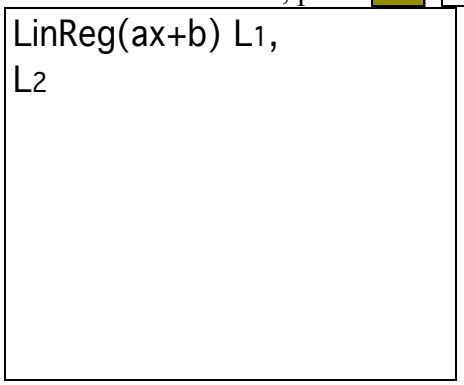
Think about why this is a good window for this example. Finally, press **GRAPH**. You should now see a scatter plot similar to the one found on page 42 of the textbook.

So now you want a regression line:

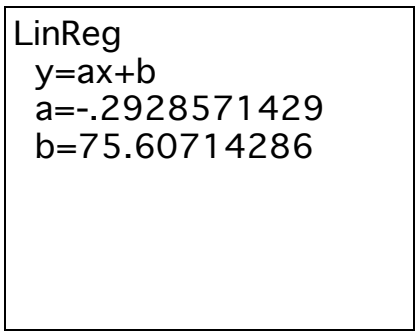
This is actually the easy part. Yay! Press **STAT** and arrow right to the CALC menu, then scroll down to LinReg(ax+b) :



Press **ENTER**. You should have a clear screen that says only LinReg(ax+b). Since our data is in lists 1 and 2, press **2nd** **L 1** **,** **2nd** **L 2** :



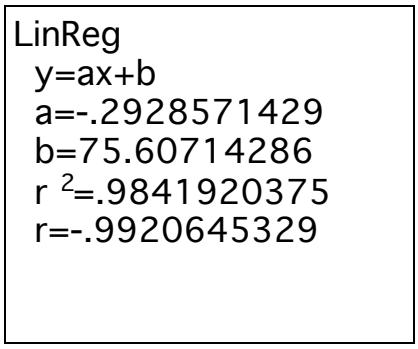
Press ENTER, and Bada-boom Bada-bing, presto change-o, abra cadabra, we have our linear regression line:



Keep in mind that a is the slope (what we have called m) and b is the vertical-intercept, which thankfully, we have also called b. So, writing this line in the form $y=b+mx$, we get that the equation of the regression line is $v=75.607-0.293T$. Which, if we look at the bottom of page 42, is quite similar to what the book told us that is was. Obviously, there is some error in rounding with the vertical intercept, but we are pretty darn close.

What about the correlation coefficient?

Excellent question. This is actually a very simple issue to address. All we need to do to get the correlation coefficient is turn on the correct mode. Press 2nd CATALOG (0), D (x^{-1}) and scroll down to DiagnosticOn , press ENTER twice, and repeat the linear regression process above. This time you should get:



Which if we check example 2 on page 45, is what they told us the correlation coefficient would be. (Hurray, we got it right).
Note that they gave us an **r** and an $\mathbf{r^2}$ value. Both are useful in practice, but for now we are only concerned with the **r** value.