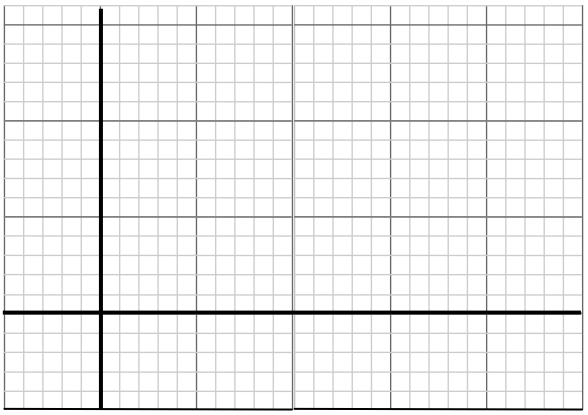
Linear Regression

YEAR (0=1900)	Life Expectancy at Birth (in years)
0	47.3
10	50
20	54.1
30	59.7
40	62.9
50	68.2
60	69.7
70	70.8
80	73.7
90	75.4

Plot the data on the grid below:



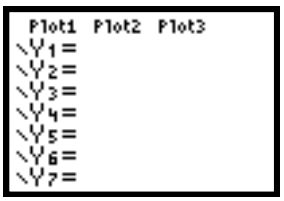
1. PREPARE YOUR CALCULATOR:

Before you begin you should clear any data from the first two lists of your calculator.

From the STAT menu select ClrList (press ENTER)

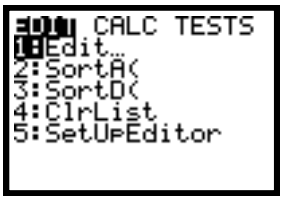
Clear existing data from List 1 and List 2

Also, make sure there are no equations in your y= editor



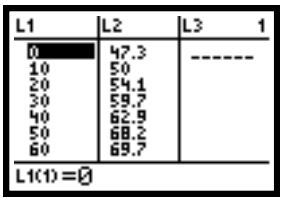
2. ENTER and PLOT THE DATA:

From the STAT menu select Edit (press ENTER)

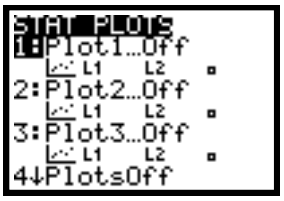


Enter the years in L1 and life expectancy in L2
(you will need to press ENTER after each value)

You will enter everything into L1 first, then use your arrows to go over to L2 and enter the data there



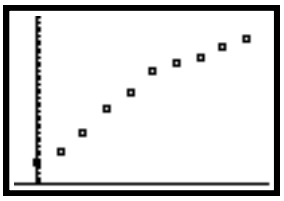
To plot the data you have to go to the STAT PLOT menu and select the first plot by pressing ENTER



Turn the plot on
Select the type of plot (scatter)
Select XLIST (L1)
Select YLIST (L2)
Select the mark

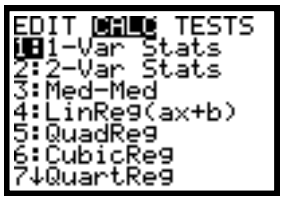
Now, determine a window that would be appropriate for your data set. Take into account the lowest and highest x values and the lowest and highest y values.

Your graph should look like this:

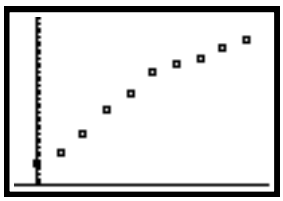


3. DETERMINING A MODEL

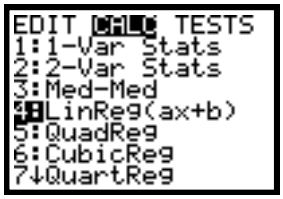
The TI-84 is capable of doing several different types of regressions. They can be accessed from the STAT CALC menu.

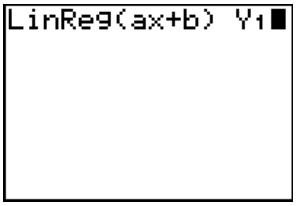


Look at the data and determine if the data has a pattern you recognize (e.g. linear, quadratic etc.) and try that type of regression. Or, you can try several regressions to see which one fits best.

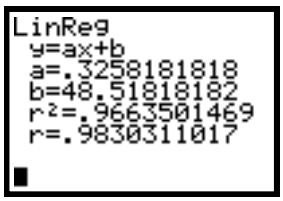


Linear Regression: From the STAT CALC menu select LinReg(ax+b). You will then press ENTER. We will store the function in Y_1 so that we will be able to graph it. Select the VARS key, then Y-VARS, then FUNCTION and then Y_1.You will then press ENTER twice.



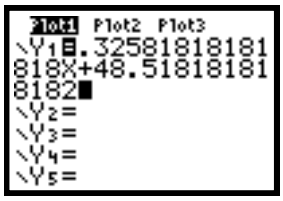


"r" is the correlation coefficient, the closer it is to 1 (or -1) the better the fit of the model.

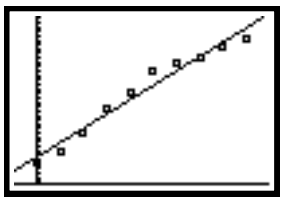


If we graph this equation with the data, we can see how well the model fits the data.

The function has been stored in Y1.



Hit the GRAPH key and the data and the model are graphed together



When you record your model on paper, 3 decimal places is sufficient. Write your function here: