MA30 APPLIED
REGRESSION USING THE TI83 GRAPHING CALCULATOR

1.   Entering Data. Enter data points as follows. (You need at least 3 or 4 points)

    a.   Press **STAT** Select **1:EDIT**
    b.   Clear Lists 1 and 2 (Cursor to the top of each column and press **CLEAR ENTER**)
    c.   Entering **independent** data in L_1 . Enter **dependent** data in L_2. (the data must be in increasing order by independent variable)

2.   Try entering the following data:

Data for a function		*(Do you know type of*
Independent (in L_1)	**Dependent (in L_2)**	*function this might be yet??)*
-10	102	Don't forget!. To make a number negative you need to use the (-) sign, not the subtraction button!
-5	28	
0	-2	
5	20	
10	88	

3.   Plotting Data. Plotting data is similar to graphing data.
    a.   De-select all **Y=** formulas or clear them so they will not graph. The equals sign will be highlighted if they *are* to be graphed.
    b.   Select **STAT PLOT** by pressing **2ⁿᵈ Y=**. Select **Plot 1**. Turn on Plot 1. Put plot into the *Scatter Plot* mode. Make sure the data is being taken from lists L_1 and L_2. Select the largest *mark* possible.
    c.   Press **GRAPH**. You should have a plot of your data!. You may need to use **ZOOM 9:ZOOMSTAT** to fit the data.

4.   Data Regression[1]. Now that you have your data entered let the TI83 calculate the *coefficients* of the type of curve you want. This is a statistical operation, **fitting the best curve to the data**. Do it like this:
    a.   Go to Catalogue [**2ⁿᵈ 0**]and select **DiagnosticOn**[2]
    b.   Press **STAT** . Select **CALC**. Select desired regression (in this case: QuadReg). Press **ENTER**
    c.   The screen will show you the A, B, C and sometimes D for the equation that best matches the data. Make sure it makes sense!
    d.   Go to the **Y=** window. Put the cursor in the first function (**Y1=**). Press **VARS** . Select **5:STATISTICS**. Select **EQ**. Select **RegEQ**
    e.   Press **GRAPH**. Both your raw data and the best fit curve will appear.

> **You probably see:**
> **a= 0.96,**
> **b= -0.72,**
> **c= -0.8**

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[1] The **TI 83 Regression** operation is very powerful. There are additional 'parameters' that can be entered. We are just using the most basic and simple mode of **Regression** above.
[2] Turning on the diagnostic will enable the calculator to display the correlation factors!. Remember how if r^2 is close to 1 then something is a good fit?

Some more data to regress for fun!

TABLE A		
Data for a quadratic function		*Use a quadratic regression here*
Independent variable (in L$_1$)	**Dependent variable(in L$_2$)**	Don't forget!. To make a number negative you need to use the (-) sign, not the subtraction button!
-10	390	
-5	100	
0	-16	
5	9	
10	137	

TABLE B		
Data for a line function		*Use the LinReg feature when you select what type of regression you want to do*
Independent variable (in L$_1$)	**Dependent variable (in L$_2$)**	
3	5	
8	10	
13	15	
18	20	

Can you *fit* a **Line** to the data in table A? **Try it!**. It will give you an answer! Notice the r^2 is not very good, it is trying to tell that the equation is not a very good match to the data! You need to use your head a little bit in sort of guessing what type of function you are expecting.

TABLE C		
Data for a cubic function		*Do a cubic regression!*
Independent (in L$_1$)	**Dependent (in L$_2$)**	
-4	0	Don't forget!. To make a number negative you need to use the (-) sign, not the subtraction button!
-2	+140	
0	-200	
2	-540	
6	+700	

TABLE D		
Data for a ??? function		*You guess what is the best function here!*
Independent (in L$_1$)	**Dependent (in L$_2$)**	
-10	0	
-5	6	
0	2	
5	7	
10	3	