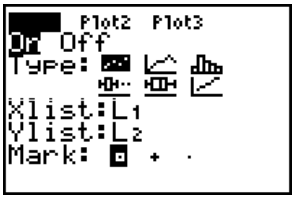
REGRESSION EQUATIONS ON THE TI-83

1. Clear all functions from Y= screen.

2. If you wish to get r values later, turn on diagnostics as follows.

- 2nd [CATALOG] ? until you get to <DiagnosticOn, then press ENTER ENTER.
- When you enter the [CATALOG], the calculator is automatically in ALPHA MODE. Pressing the key with D above it will cause the catalog listing to jump to the first entry beginning with that letter.

3. Turn on STAT PLOT.



- 2nd STAT PLOT STAT PLOTS 1:Plot1... Off ENTER = On ENTER.
- ? Type: highlight first graphing option ENTER.
- ? Xlist: 2nd L1 ENTER.
- ? Ylist: 2nd L2 ENTER.
- ? Mark: highlight desired option ENTER 2nd QUIT.
- When you are finished with the statistics applications, you will need to turn off STAT PLOT: 2nd STAT PLOT STAT PLOTS 4:PlotsOff ENTER. The STAT PLOT can also be turned on and off in the Y= screen.

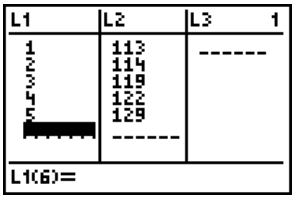
4. Enter data points.

- STAT 1:Edit ENTER.
- You can clear old data as follows: > L1 CLEAR ENTER. Enter the x-values in L1 and the y-values in L2. Press ENTER after each entry. (You cannot use 0 as an x-value if you are going to do logarithmic regression. In that case, enter .000001 instead of 0 for x.) Enter each pair side-by-side.
- 2nd [QUIT] after all data is entered.

Example: Data pairs:

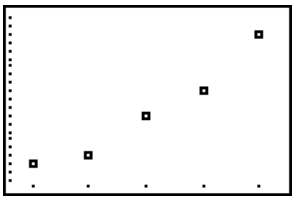
1	113
2	114
3	119
4	122
5	129

Lists:



5. Draw scatter plot.

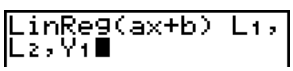
Scatter plot:



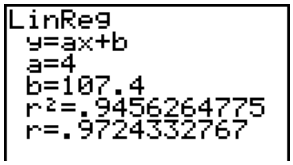
- ZOOM 9:ZoomStat ENTER.
- 2nd [QUIT].

6. Calculate and store linear regression equation.

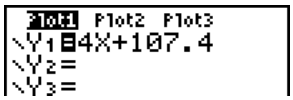
- STAT < CALC 4:LinReg(ax+b) ENTER 2nd [L1] , 2nd [L2] , VARS < Y-VARS 1:Function ENTER FUNCTION 1:Y_1 ENTER.
- The default lists are L1 and L2 and may be omitted.



- The coefficients and r value are displayed on the home screen.

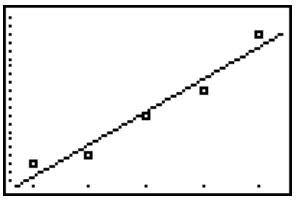


- The regression equation is stored in Y_1=.



7. Superimpose regression line on scatterplot.

- [ZOOM] ZOOM 9:ZoomStat [ENTER].



8. The correlation coefficient r.

- The correlation coefficient r is a number between –1 and +1 that indicates the closeness of the fit of the regression line. The closer |r| is to 1, the better the fit. This line is a good fit, but there may be another type of regression that is better.

9. Using the regression equation to predict other y-values.

- Example: To find y when x = 10: [VARS] [<] Y-VARS 1:Function [ENTER] FUNCTION 1:Y_1 [ENTER] [(] [1] [0] [)] [ENTER]
- You could also store 10 as X and then evaluate Y_1.
- You could also use the graph and the [2nd] [CALC] CALCULATE 1:value option.

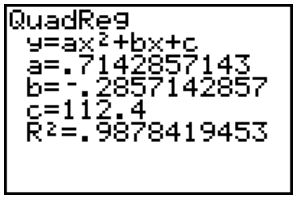
10. Clearing an entire list of old data.

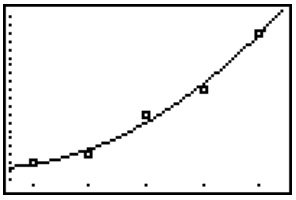
- There are several methods for clearing old data, but one of the easiest is: [STAT] 1:Edit, use the up arrow [>] highlight the name of the list you wish to clear, then press [CLEAR] [ENTER]

11. Calculating other types of regression models.

- **Quadratic model:**

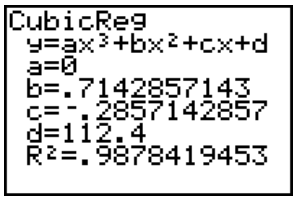
  $y = .714x^2 – .286x + 112.4$
  (rounded to 3 decimals)

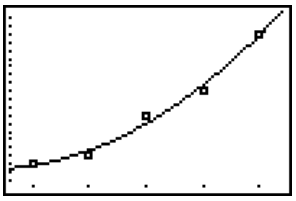




- **Cubic model:**

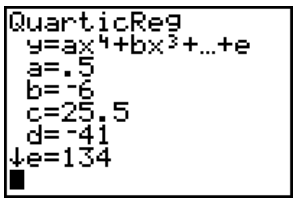
  $y = .714x^2 – .286x + 112.4$
  Isn't that strange!!

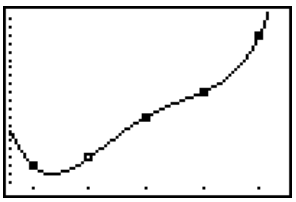




- **Quartic model:**

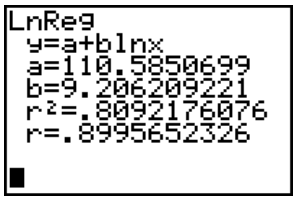
  $y = .5x^4 – 6x^3 + 25.5x^2 – 41x + 134$

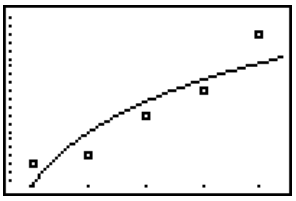




- **Natural logarithmic model:**

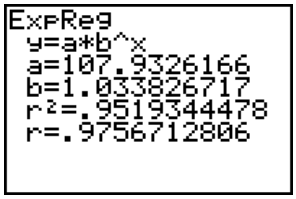
  $y = 9.206 \ln x + 110.585$

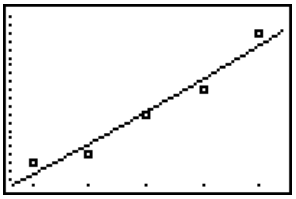




- **Exponential model:**

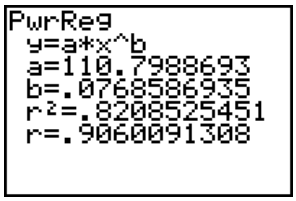
  $y = 107.933*(1.034^{x})$

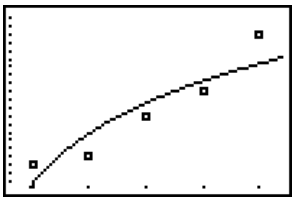




- **Power regression model:**

  $y = 110.799*x^{.077}$





Regression Equations on the TI-83
Judy Ahrens
Pellissippi State Technical Community College
January 30, 1999