REGRESSION EQUATIONS ON THE TI-82

1. Prepare y= screen.

- Clear y1. Either clear all other equations or turn them off.
- To turn off y2: [y=] [?] Y2=, use arrow keys to position cursor over = sign, press [ENTER].

2. Turn on STAT PLOT.

- [2nd] [STAT PLOT] 1: Plot 1... [ENTER].
- [=] On [ENTER].
- [?] Type: highlight first graphing option, press [ENTER].
- [?] Xlist: highlight L1 [ENTER].
- [?] Ylist: highlight 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] [4] PlotsOff [ENTER].

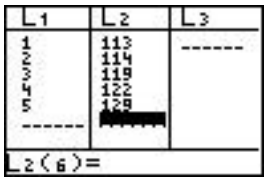
3. Clear old data.

- An easy way of clearing an entire list is: [STAT] **1:Edit,** use the up arrow [>] to highlight the name of the list you wish to clear, then press [CLEAR] [ENTER].
- Another method is used in the home screen: [STAT] 4:ClrList [2nd] [L1] [ENTER].

4. Enter data points.

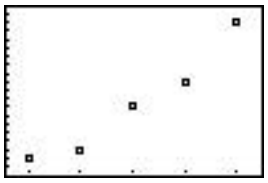
- [STAT] 1: Edit [ENTER].
- Clear old data, then enter the x-values in L1 and the y-values in L2. Press [ENTER] after each entry. Enter each pair side-by-side, and be sure you have the same number of entries in each list. (You cannot use 0 as an x-value for logarithmic regression; enter .000001 instead of 0 for x.)
- [2nd] [QUIT] after all data is entered.
- **Example:** Data pairs: 1 113, 2 114, 3 119, 4 122, 5 129

Lists:



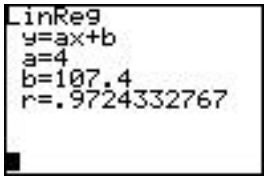
5. Draw scatter plot.

Scatter plot:



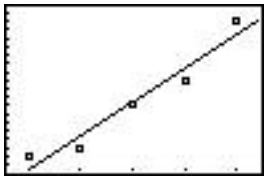
- [ZOOM] 9: ZoomStat [ENTER].
- [2nd] [QUIT].

6. Calculate linear regression equation.



- [STAT] [<] CALC 5:LinReg(ax+b) [2nd] [L1] [,] [2nd] [L2]
- The default lists are L1 and L2 and may be omitted.
- This means that y = 4x + 107.4 is the ***line*** of best fit.

7. Store regression equation as Y_1.



- This must be done immediately after the regression equation is calculated.
- [Y=] Y_1= [VARS] [5] 5:Statistics...
  [<] [<] EQ [7] 7:RegEQ [ENTER] [2nd] [QUIT].
- To superimpose regression equation on scatterplot: [GRAPH].

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 even better.

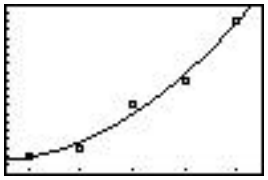
9. Use regression equation to predict other y-values.

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

10. Calculate other types of regression models: coefficients rounded to 3 decimals.

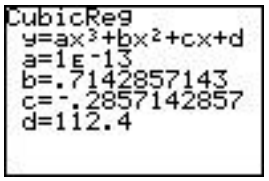
- **Quadratic model: QuadReg**

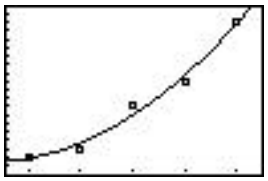
  $y = .714x^2 - .286x + 112.4$



- **Cubic model: CubicReg**

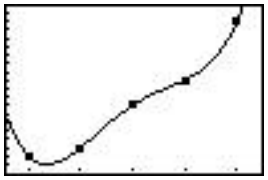
  $y = .714x^2 - .286x + 112.4$
  Isn't that strange!!





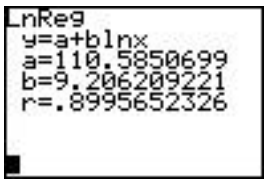
- **Quartic model: QuartReg**

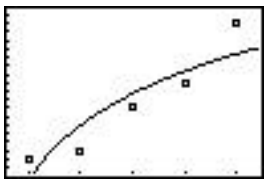
  $y = .5x^4 - 6x^3 + 25.5x^2 - 41x + 134$
  This is a perfect fit!



- **Natural logarithmic model: LnReg**

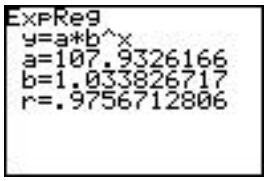
  $y = 110.585 + 9.206 \ln x$

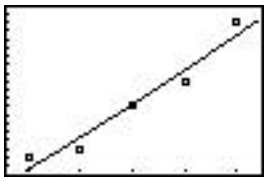




- **Exponential model: ExpReg**

  $y = 107.933*(1.034^x)$





Regression Equations on the TI-82
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