

# Stat Calc Operations: LinReg(ax+b)

Find an equation of a line which fits a table of values using Linear Regression.

For this example, we have data entered into  $L_1 = \{3.8, 5.6, 5.9, 6.4, 7.4\}$  and  $L_2 = \{4, 6, 7, 7, 8\}$ . See handout for Stat Edit Operations: entering data.

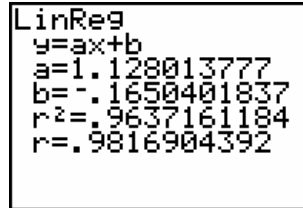
Keystrokes

Screen

Access the Stat Calc Menu:

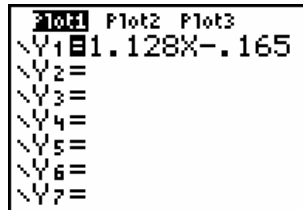


Select option 4: LinReg(ax+b):



Note: by default, the calculator assumes that  $L_1$  is the set of inputs and  $L_2$  is the set of outputs. See below for other options. Also, our screen shows the correlation coefficients, useful in statistics settings. See the handout for Correlation Coefficient.

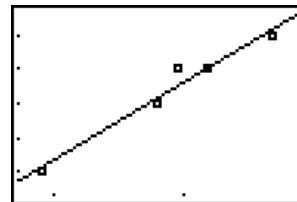
Now we see that the equation of the line that best fits this data is approximately  $y = 1.128x - .165$ . To graph this line, enter the following into the Equation Editor:



Graph the function:



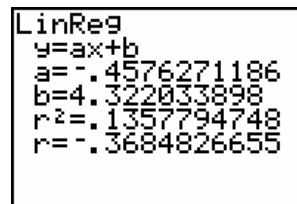
Note: the data from the scatterplot is displayed as well. See StatPlot: Scatterplot handout.



You can use data in other lists. For this example, enter  $L_3 = \{1, 5, 7, 2\}$  and  $L_4 = \{4, 2, 0, -1\}$  into the List Editor (see handout for Stat Editor Operations: entering data).

L2	L3	L4	4
1	1	4	
5	5	2	
7	7	0	
2	2	-1	
L4(5) =			

To define the regression using  $L_4$  for the inputs,  $L_3$  for the outputs, enter the following:



More questions? Contact the Metropolitan State University Math Center at 651-793-1460, 651-793-1463 (Fax) or [math.center@metrostate.edu](mailto:math.center@metrostate.edu).

## Keystrokes

## Screen

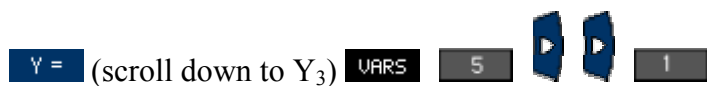
You can paste the regression equation directly into the Equation Editor. There are three ways to do this.

One way is to assign the regression result to a function when you are performing the regression. The format for the regression is **LinReg(ax+b)** *inputs, outputs, function*. Enter the following:



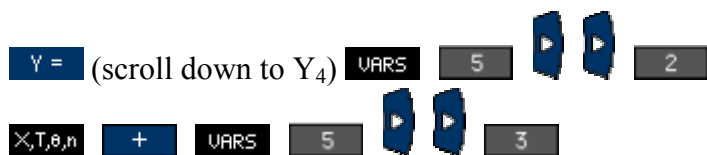
```
LinReg(ax+b) L4,
L3, Y2
```

Another way is to call up the most previous regression result while in the Equation Editor. Enter the following:



```
Plot1 Plot2 Plot3
\Y1=1.128X-.165
\Y2=-.4576271186
4407X+4.32203389
83051
\Y3=-.4576271186
4407X+4.32203389
83051
```

Another way is to call up the coefficients from the most previous regression result while creating the function in the Equation Editor. Enter the following:



```
Plot1 Plot2 Plot3
\Y2=-.4576271186
4407X+4.32203389
83051
\Y3=-.4576271186
4407X+4.32203389
83051
\Y4=aX+b
```

*Note: Option 4: **LinReg(ax+b)** follows the typical notation for linear functions in algebra courses, where  $a$  is the slope and  $b$  is the  $y$ -intercept. Under the Stat Calc menus, option 8: **LinReg(a+bx)** follows the typical notation for linear functions in statistics courses, where  $b$  is the slope and  $a$  is the  $y$ -intercept. The use and format is the same, as demonstrated by the example below, which repeats the first example on this handout.*



```
LinReg
y=a+bx
a=-.1650401837
b=1.128013777
r^2=.9637161184
r=.9816904392
```

*Note: you can also perform quadratic **QuadReg**, cubic **CubicReg**, quartic **QuartReg**, natural logarithmic **LnReg**, exponential **ExpReg**, power **PwrReg**, logistic **Logistic** and sine **SinReg** regression using the functions available in the Stat Calc menu.*

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