

# CREATING SCATTERPLOTS AND REGRESSION EQUATIONS ON A TI 83/84

*How do I get to the Stat Editor?*

Press STAT and then press ENTER.


L1	L2	L3	2
1 2 3 4 5 -----	----- ----- ----- ----- ----- -----	----- ----- ----- ----- ----- -----	
L2(1)=			



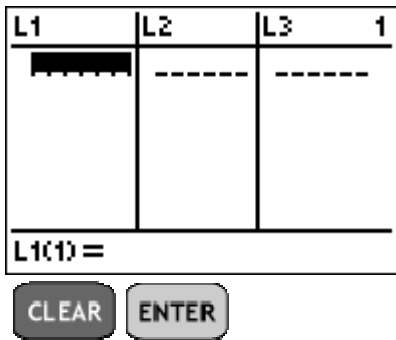
*How do I clear a list in my Stat Editor?*

If you want to erase all the entries in a list, such as  $L_1$  below, use the arrow keys to scroll to the top of the list, press CLEAR, and then press ENTER.

L1	L2	L3	2
1 2 3 4 5 -----	----- ----- ----- ----- ----- -----	----- ----- ----- ----- ----- -----	
L2(1)=			

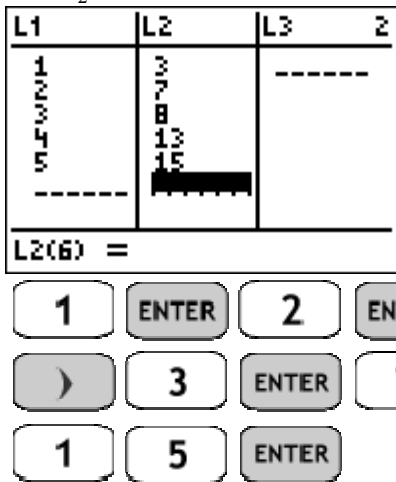
 L1	L2	L3	1
1 2 3 4 5 -----	----- ----- ----- ----- ----- -----	----- ----- ----- ----- ----- -----	
L1 = (1, 2, 3, 4, 5)			





*How do I enter numbers in the lists?*

Just hit the key for that number and press ENTER. When you have populated one list, use the arrow keys to go to the next list. Also, for most operations and calculations,  $L_1$  and  $L_2$  are the default lists for input and output values.

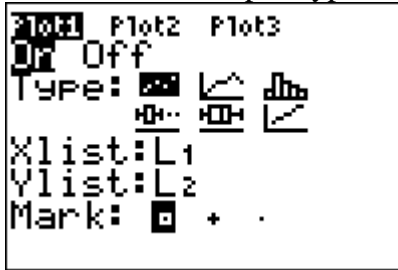


*How do I activate a Stat Plot?*

Press 2<sup>nd</sup>, Y=, ENTER to select Plot1.

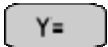
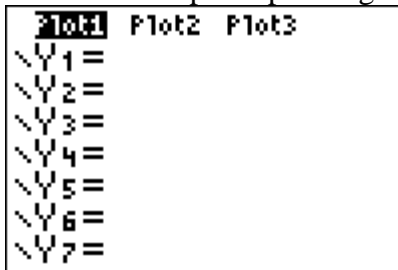


Next, use the arrow keys to navigate through the list, and make sure that ON is selected as well as the first plot type,  $L_1$ , and  $L_2$ .

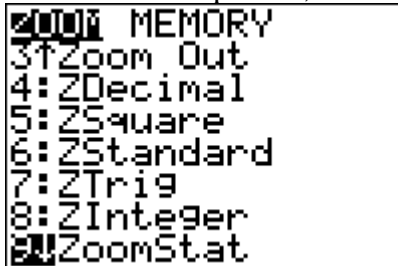


*How do I graph my scatterplot?*

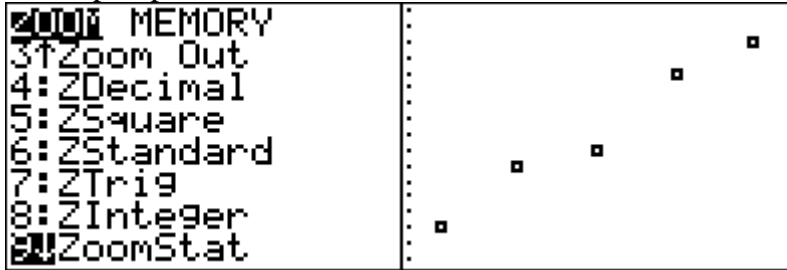
First, press  $Y=$  to make sure that there are no superfluous functions in your graph editor that might interfere with the viewing of your scatterplot. If there are any functions you want to get rid of, use the arrow keys to scroll to the function and press CLEAR. Also, notice that Plot1 is highlighted at the top. This is verification that Plot1 has been activated. You can also either activate or deactivate Plot1 by using the arrow keys to scroll to the top and pressing ENTER.



Once you've eliminated all unnecessary functions in the graph editor, press ZOOM and scroll down to option 9, ZoomStat.



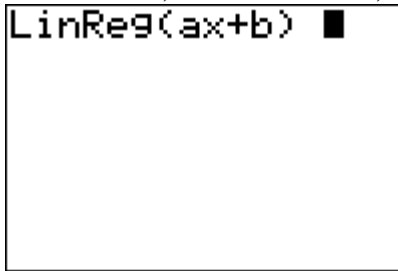
Now press ENTER, and ZoomStat will automatically adjust the viewing window so that all the plot points can be seen.



ENTER

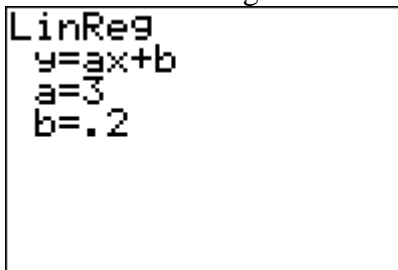
*How do I do a linear regression?*

Press STAT, scroll to CALC, scroll down to option 4, LinReg (ax+b), and hit ENTER.



STAT   )   ▾   ▾   ▾   ENTER

Now hit ENTER again to obtain the regression equation.



ENTER

What do I do if I don't see the values for  $r$  or  $r^2$  on the screen?

First, press 2<sup>nd</sup>, 0 to open the catalog.

```
CATALOG M  
▸abs(  
and  
angle(  
ANOVA(  
Ans  
Archive  
Asm(  
▾
```

2nd 0

Scroll down to DiagnosticOn and press ENTER twice.

```
CATALOG M a=3  
Degree b=.2  
DelVar  
DependAsk  
DependAuto  
det(  
DiagnosticOff DiagnosticOn Done  
▸DiagnosticOn ▾
```

▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾  
▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾  
▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾  
▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾  
▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾ ▾  
▾ ENTER ENTER

Now repeat the procedure for doing a linear regression, and the diagnostics will appear.

```
LinReg  
y=ax+b  
a=3  
b=.2  
r2=.9698275862  
r=.9847982464  
▾
```

STAT ▸ ▾ ▾ ▾ ENTER ENTER

*How can I automatically paste my regression equation into my graph editor?*

Begin by pressing STAT, go to the CALC menu, select LinReg (ax+b), and press ENTER.

```
LinReg(ax+b) █
```



Now press VARS.

```
VARX Y-VARS  
1: Window...  
2: Zoom...  
3: GDB...  
4: Picture...  
5: Statistics...  
6: Table...  
7: String...
```



Scroll to Y-VARS.

```
VARX Y-VARS  
1: Function...  
2: Parametric...  
3: Polar...  
4: On/Off...
```



Hit ENTER to select Function.

```
FUNCTION  
1: Y1  
2: Y2  
3: Y3  
4: Y4  
5: Y5  
6: Y6  
7: ↓Y7
```



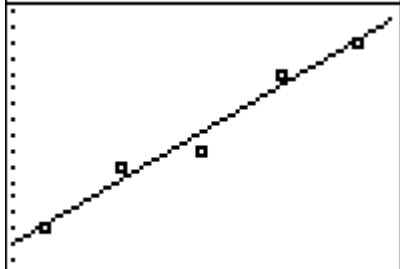
And hit ENTER again to select  $Y_1$ .

```
LinReg(ax+b) Y1
```

ENTER

If you hit ENTER again, then your calculator will now automatically paste the regression equation into your graph editor as  $Y_1$ . You can view this if you hit  $Y=$ . And when you press GRAPH, the graph of the regression function will appear along with your scatterplot.

LinReg	Plot1 Plot2 Plot3
$y=ax+b$	$\backslash Y_1=3X+.2$
$a=3$	$\backslash Y_2=$
$b=.2$	$\backslash Y_3=$
$r^2=.9698275862$	$\backslash Y_4=$
$r=.9847982464$	$\backslash Y_5=$
	$\backslash Y_6=$
	$\backslash Y_7=$



ENTER

$Y=$

GRAPH

*What other kinds of regressions can I do to find mathematical models for scatterplots?*

The CALC menu that you access by first pressing STAT contains procedures for a variety of mathematical regressions. Most of these also return either an  $r$  or  $r^2$  value which helps you determine how well the model fits the data. For  $r^2$ , the closer the value is to 1, the better the fit, and the closer it is to 0, the worse the fit is to the existing data.

The regression procedures we'll use most often are:

LinReg (ax+b)      Finds the linear function that best fits the data,  $y = ax + b$ .

QuadReg            Finds the best fitting quadratic function,  $y = ax^2 + bx + c$ .

CubicReg           Finds the best fitting cubic polynomial function,  
 $y = ax^3 + bx^2 + cx + d$ .

QuartReg           Finds the best fitting fourth degree polynomial function,  
 $y = ax^4 + bx^3 + cx^2 + dx + e$ .

LnReg               Finds the best fitting logarithmic function,  $y = a + b \ln x$ .

ExpReg              Finds the best fitting exponential function,  $y = ab^x$ .

PwrReg              Finds the best fitting power function,  $y = ax^b$ .

Logistic            Finds the best fitting logistic function,  $y = \frac{c}{1 + ae^{-bx}}$ .