

TI 83 Line of Best Fit

Produces a scatterplot, and then a line of best fit for a table of data involving two variables.

1. Press **STAT** (left of arrow buttons)
2. Press 1:Edit (or press **ENTER** since 1 is the default choice)

```

3:000 CALC TESTS
1:1 Edit...
2: SortA(
3: SortD(
4: ClrList
5: SetUpEditor
    
```

3. If the list has data in it already, as shown below, you can clear the list(s)

L1	L2	L3	Z
3546	19	-----	
2795	23		
2600	23		
3515	19		
3245	23		
3930	17		
3115	20		

L2(1)=19

To clear a list,

- a. Press **STAT** button

```

3:000 CALC TESTS
1:1 Edit...
2: SortA(
3: SortD(
4: ClrList
5: SetUpEditor
    
```

- b. Press **4** to choose 4:ClrList
ClrList

- c. Press **2nd** and the **1** key (which will enter a L₁ if you want to erase List 1)

- d. Press **ENTER** and you will see this

```

ClrList L1
Done
    
```

- e. Repeat steps a through d until all the lists you want cleared are clear. To clear list 2, in step c you would press **2nd** and the **2** key, and so on. You can also clear several at one time by entering commas between list names as in

```

ClrList L1
Done
ClrList L2
Done
ClrList L1,L2
Done
    
```

4. If you had to clear lists, you need to repeat steps 1 and 2 to see empty lists ready to be filled. (Steps 1 and 2: Press **STAT** and **ENTER**)

L1	L2	L3	1
████████	-----	-----	

L1(1)=

5. Start entering data into L1, pressing **ENTER** after each item. L1 is using the x value from each (x,y) pair. Examples are shown below.
6. When you are done with L1, use the right arrow key, **→**, to get into L2

L1	L2	L3	2
1 2 3 4 5 6 7 8 9 0	████████	-----	

L2(1)=

7. Enter the L2 data, pressing **ENTER** after each item. Some sample data is below.

L1	L2	L3	3
1 2 3 4 5 6 7 8 9 0	5 11 14 18 28 30 37	████████	

L3(1)=

8. You may need to adjust the Window to fit your data. Press the **WINDOW** key (beside the Y= key)

```

WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-10
Ymax=10
Yscl=1
Xres=1

```

- a. In our case, the Ymax is not big enough. You can change those values.

```

WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-10
Ymax=40
Yscl=1
Xres=1

```

9. Before you graph, you should turn off any graphs in the **Y=** window.

- a. Press the $\boxed{Y=}$ key.

```

Plot1 Plot2 Plot3
\Y1=sin(X)
\Y2=X/315
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=

```

- b. Drag the cursor over the highlighted = and press \boxed{ENTER} . This will 'turn off' the graphs of those functions without you having to erase that function. You will lose the Y1 function during the best fit process.

```

Plot1 Plot2 Plot3
\Y1=sin(X)
\Y2=X/315
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=

```

10. You need to turn on the scatter plot function.

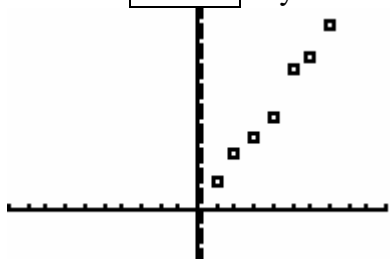
- Press $\boxed{2^{nd}}$ and the $\boxed{Y=}$ key (to turn on the STAT PLOT)
- Press \boxed{ENTER} to choose Plot 1
- Press \boxed{ENTER} again while the cursor is over the On.
- Make sure that your Xlist is L1 and your Ylist is L2

```

Plot1 Plot2 Plot3
On Off
Type: [ ] [ ] [ ]
      [ ] [ ] [ ]
Xlist:L1
Ylist:L2
Mark: [ ] + .

```

11. Press the \boxed{GRAPH} key



12. Now we will try to find the line of Best Fit. We're going to try to fit it to a straight line. Other types of functions could be used (fit it to a quadratic equation, or a cubic, or a natural log,...)

- Press the \boxed{STAT} key

- b. Arrow over to the **CALC** menu

```
EDIT CALC TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7↓QuartReg
```

- c. Press **4** to choose 4:LinReg(ax + b)

```
LinReg(ax+b) ■
```

- d. Press **2nd** and the **1** key to get L1

- e. Press the comma key **,**

- f. Press **2nd** and the **2** key to get L2

- g. Press the comma key **,**

- h. Press the **VARS** key (below the arrows, next to **CLEAR**)

- i. Arrow over to Y-VARS

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

- j. Press **ENTER** to choose 1:Function and see

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

- k. Press **ENTER** again to select Y1

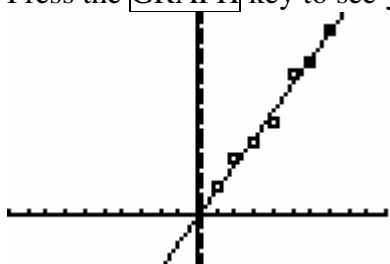
```
LinReg(ax+b) L1,
L2, Y1 ■
```

- l. Press **ENTER** again to process your request and you will see our line of best fit is approximately $y = 5.29x - 0.71$

```
LinReg
y=ax+b
a=5.285714286
b=-.7142857143
r2=.9806590258
r=.990282296
```

The close $|r|$ is to 1, the better fit you have.

13. Press the **GRAPH** key to see your best fit line together with your scatter plot.



14. You can also see your line of best fit as Y1 if you press the Y= button.