

## 4.4 Line of best fit

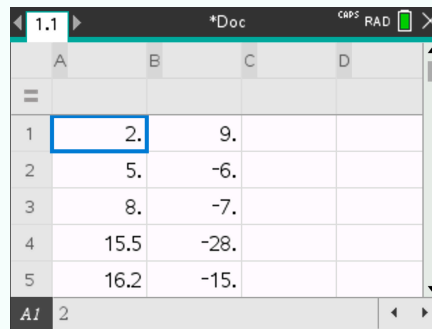
**keywords:** *pearson moment product correlation coefficient, linear regression, spearman's rank coefficient.*

Suppose you want to do a linear regression on the following table:

<b>x</b>	2	5	8	15.5	16.2	14	12	13	2.5	1	0.5	-3
<b>y</b>	9	-6	-7	-28	-15	-20	-15	-20.3	9	4.1	6	12.1

### 4.4.1 Enter the data

Create a new document and select Add Lists & Spreadsheet, and fill the list A with the  $x$ -values, and the list B with the  $y$ -values:




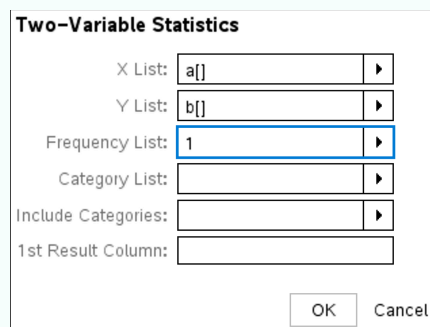
The screenshot shows a TI-Nspire CX spreadsheet with columns A, B, C, and D. The data from the table above is entered as follows:

	A	B	C	D
1	2.	9.		
2	5.	-6.		
3	8.	-7.		
4	15.5	-28.		
5	16.2	-15.		

The status bar at the bottom shows 'A1 2'.

### 4.4.2 Find $\bar{x}$ and $\bar{y}$


Press  and select Statistics > Stat Calculations > Two-Variable Statistics, and fill the parameters as follows:




The 'Two-Variable Statistics' dialog box is shown with the following settings:

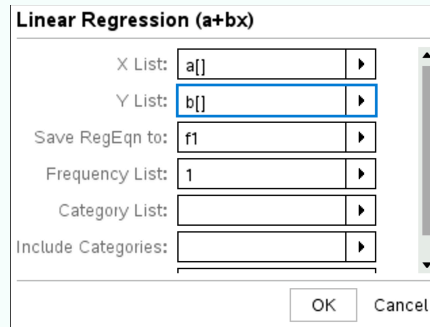
- X List: a[]
- Y List: b[]
- Frequency List: 1
- Category List: (empty)
- Include Categories: (empty)
- 1st Result Column: (empty)

Buttons for 'OK' and 'Cancel' are visible at the bottom.

Press . The results are displayed in the table and should be  $\bar{x} = 7.23$  and  $\bar{y} = -5.93$

### 4.4.3 Compute the line of best fit


- ① Press  and select Statistics > Stat Calculations > Linear Regression (ax+b).
- ② Choose the parameters as follows:

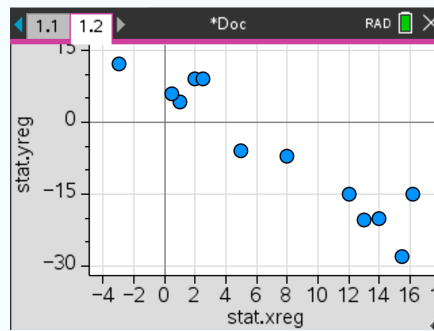


- ③ Press  and the following result should appear:

	=LinRegB
Title	Linear R...
RegEqn	a+b*x
a	8.12106
b	-1.94409
r <sup>2</sup>	0.90294

### 4.4.4 Graph the line of best fit with the data

- ① Press  and select Add Data & Statistics.
- ② In the y-axis name, select 'stat.yreg'. In the x-axis name, select 'stat.xreg'.



③ choose an appropriate window to have all the points fit nicely in the screen. Here, we chose **Xmin=-5**, **Xmax=18**, **Ymin=-30** and **Ymax=15** (since the minimal  $x$ -value is  $-3$ , we chose a slightly smaller **Xmin=-5**)

④ Press  and select Analyze > Regression > Show Linear (ax+b). Press .

