

Resetting the TI-83 Calculator

This process will ERASE all your apps.

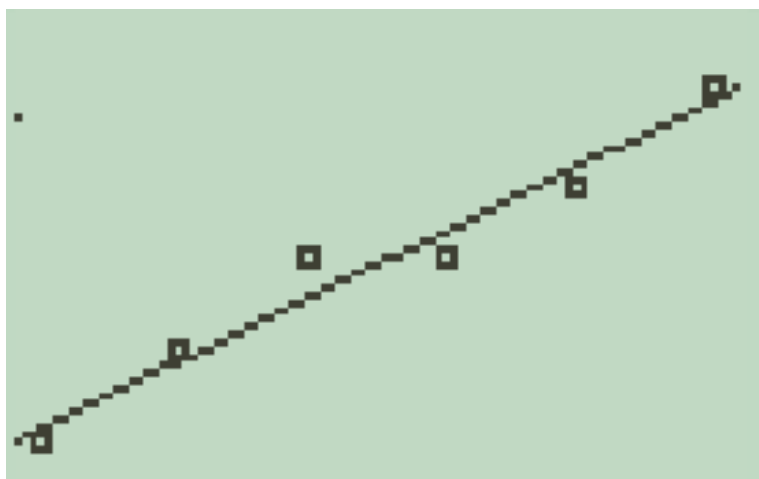
1. Press the 2nd key
2. Press +
3. Press 7
4. From the ALL menu, select 1: All Memory
5. Press 2
6. You should see
TI-83 Plus
Mem cleared

Find the best linear model for the following data.

Years After 1990	Conversation Length
9	2.38
10	2.56
11	2.74
12	2.73
13	2.87
14	3.05

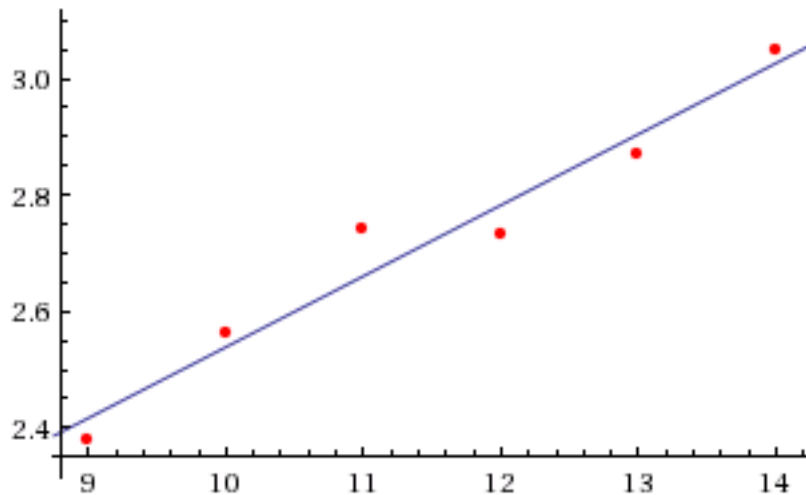
1. We need to create 2 lists, L_1 and L_2 on the calculator.
2. Press STAT and on the EDIT menu, select 1: Edit
3. Under L_1 , enter 9, 10, 11, 12, 13, and 14
4. Under L_2 , enter 2.38, 2.56, 2.74, 2.73, 2.87, 3.05
5. Press STAT and on the CALC menu, select 4: LinReg (ax+b)
6. Press 2nd-1, Comma, 2nd-2, Comma, VARS
7. Under the Y-VARS menu, select 1: Function
8. Under the FUNCTION menu, select 1: Y_1
9. Press ENTER
10. You should see
LinReg
 $y = ax+b$
 $a = .122$
 $b = 1.318666667$
 $r^2 = .9538114129$
 $r = .9766326909$

11. If you do not see r^2 and r , go to catalog (2nd 0) and turn Diagnostics On
12. Press WINDOW
13. SET $8.8 \leq x \leq 14.2$ $2.3 \leq y \leq 3.2$ Yscl = 1 Xres = 1
14. Press 2nd-Y= to access STAT PLOT
15. Press ENTER and Turn the Plot on
16. Press Y= to see the equation for the "Line of Best Fit"
17. Press GRAPH to see the Scatter Plot & Line of Best Fit
18. The Coefficient of Correlation is $r = 0.9766326909$
19. The Coefficient of Determination is $r^2 = 0.9538114129$



20. To Predict the conversation length in 2021, Press VARS
Y-VARS, Function, Y1, Show Y1(31)
Outcome = 5.101

21. We can also set this up, using [Wolframalpha.com](https://www.wolframalpha.com)
22. Linear Regression (9, 2.38), (10, 2.56), (11, 2.74), (12, 2.73), (13, 2.87), (14, 3.05)
23. Least-squares best fit: $0.122x + 1.31867$



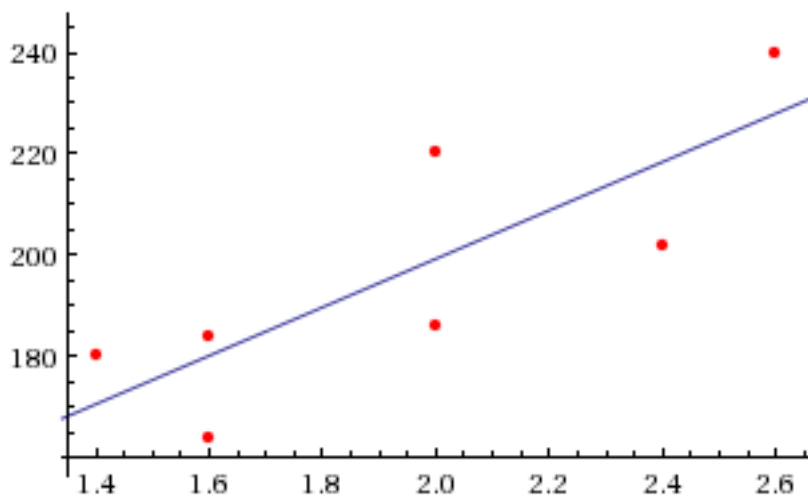
How do we interpret the relevance of the coefficient of correlation?

- | | | |
|----|---------------|---|
| 1. | Exactly -1.00 | A perfect downhill (negative) linear relationship |
| 2. | -0.70 | A strong downhill (negative) linear relationship |
| 3. | -0.50 | A moderate downhill (negative) relationship |
| 4. | -0.30 | A weak downhill (negative) linear relationship |
| 5. | 0.00 | No linear relationship |
| 6. | +0.30 | A weak uphill (positive) linear relationship |
| 7. | +0.50 | A moderate uphill (positive) relationship |
| 8. | +0.70 | A strong uphill (positive) linear relationship |
| 9. | Exactly +1.00 | A perfect uphill (positive) linear relationship |

Use a TI-83 or TI-84

1. For the following data, make a scatter plot
2. Find the equation for the Line of Best Fit
3. Draw the Line of Best Fit
4. Find the Coefficient of Correlation
5. Find the Coefficient of Determination

Advertising in Thousands	Sales in Thousands
2.4	202
1.6	184
2.0	220
2.6	240
1.4	180
1.6	164
2.0	186



$$y = 47.767x + 103.767$$

Coefficient of Correlation: $0.8123823955 \approx 0.812$

Coefficient of Determination: $0.6599651565 \approx 0.660$

Assignment 108:

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