

Dinner Party: What's the equation?

Learning Objective: Given 2 or more points, I can use my calculator to determine the equation of the line.

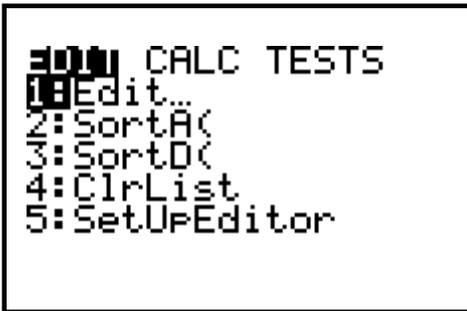
Your boss asks you to plan a retirement party for one of your co-workers. You are comparing the cost of a dinner party at different restaurants. Each restaurant charges a flat room fee (no matter how many guests attend) and a per plate fee.

The chart shows the costs of a party at Linear Bistro for different numbers of guests. What is the room fee at Linear Bistro? What is the per plate fee?

Guests	Cost
5	260
10	370
20	590
25	700
50	1250

To find out,

STEP 1: press [STAT], [1] "Edit" and enter the data into **L1** and **L2** in your calculator.



L1	L2	L3	Z
5	260	-----	
10	370		
20	590		
25	700		
50	1250		
-----	-----		
L2(5) =1250			

STEP 2: Click [WINDOW] and adjust your window settings as shown.

WINDOW
Xmin=-10
Xmax=60
Xscl=5
Ymin=-100
Ymax=1500
Yscl=100
Xres=1

STEP 3: Press [2ND] [Y=] "Stat Plot" [1] "Plot1." Select "On" and hit [GRAPH] to make a scatter plot of the data from the chart.

Draw a rough sketch of what you see below.



Name: _____ Date: _____ Period: _____

The points form a line, so this data is **linear**.

STEP 4: To generate an equation click [STAT], scroll right to "Calc," click [4] "LinReg (ax+b)"

Then click [2ND] [1] [,] [2ND] [2] [VARS] and scroll to the right "Y-Vars", now press [1] "Function" [1] "Y1" [ENTER].

*(Adding **Y1** to the end of the command stores the equation of the line in **Y1** so you can look at the equation and graph!)

You should see "y=... a=... b=..."

Press [GRAPH] to view the graph.



3. Describe the line. Do all the points lie on the line?

The y-intercept of the line represents the flat room fee at Linear Bistro.

4. What does the slope of the line represent?

5. Use the scale on the y-axis to estimate the y-intercept and slope.

We can use a function table to find the exact value of the y-intercept.

FINALLY, THE CALCULATOR HAS ALREADY STORED THE EQUATION!!!

Click [Y]. Voila! Your equation should be stored on Y1. If it is not you did not select the "Y1" feature when you carried out your Linear Regression during Step 4.

THE EQUATION IS: _____.

So, the slope is: _____. And the y-intercept is: _____.

Which means: The cost per plate is: _____ and the room fee is: _____.