# USING THE TI-83 PLUS GRAPHING CALCULATOR TO MAKE A GRAPH

## LAB MSC 2.CALC

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## PURPOSE

This activity is designed to familiarize students with the TI-83 Plus graphing calculator and its use, preparing them so they can utilize it in other situations.

## PROCEDURE

The data below were obtained from the extension to the Freezing Point Depression activity. Use the following instructions to enter the data into your calculator and to graph it.

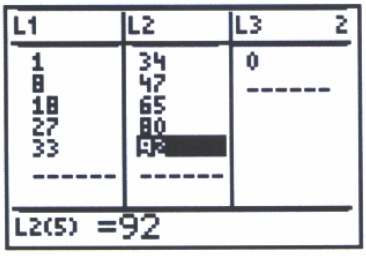
| Temperature (°C) | Temperature (°F) |
|---|---|
| 1 | 34 |
| 8 | 47 |
| 18 | 65 |
| 27 | 80 |
| 33 | 92 |

### ENTERING DATA INTO THE CALCULATOR

1. Turn the calculator ON. Press STAT then 1 (Selects 1:Edit). The list editor (which is similar to a spreadsheet) will now be displayed.

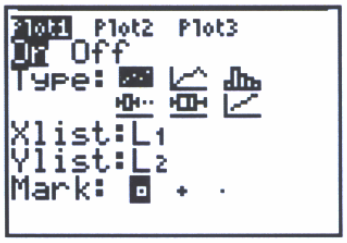
2. If there are already data in the lists, use the arrow keys to move to the top of one of the lists that has data in it, so that the column heading (L1, L2, or L3) is selected, then press CLEAR and ENTER. This will delete the data that is displayed. Repeat this for each list.

3. To enter new data, begin entering data at the top of the data column, as you would with a spreadsheet. Pushing ENTER after each entry will move the cursor to the next "row" in the list editor. For this exercise, enter °C temperatures into L1 and °F temperatures into L2. When you are done, your screen should look like the one shown below.

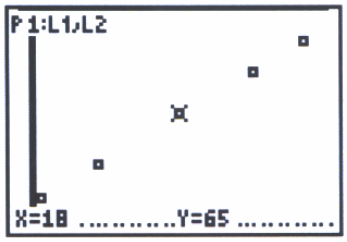


**MAKING A GRAPH OF °F (L2) VS. °C (L1).**

1. First clear the equation stored in Y1 by pressing
   Y=
   CLEAR
2. **Selecting a Stat Plot.** Use the following keystrokes to select Plot1.
   2nd
   STAT PLOT  Displays the Stat Plot editor
   1  Selects Plot1
3. Selecting the options for Plot1. The options for Plot1 are displayed on the calculator screen. You want your calculator screen to look just like the one shown in step 4. To select an option, use the arrow keys to move the cursor to it and press ENTER to select it.
   Use the following keystrokes to select L1 (°C) for Xlist:
   2nd
   L1  Selects L1
   ENTER
   Use the following keystrokes to select L2 (°F) for Ylist:
   2nd
   L2  Selects L2
   ENTER
4. Your calculator screen should now look just like the **one shown below.**




5. **Viewing your graph.** Press **GRAPH** to view your graph. If you do not see a graph on the calculator screen, press **ZOOM** then **9**. You should now see your graph. Press **TRACE**, the use ← and → to move between points on the graph. The X and Y coordinates of the cursor are displayed on the bottom of the calculator screen as shown below.

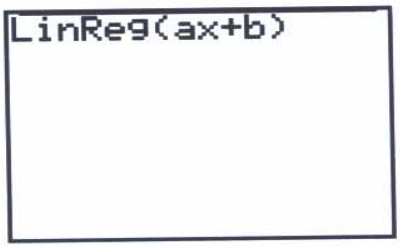


6. If there is a correlation between °F and °C, you should be able to draw a straight line through the points in your graph. This straight line is called a *line of fit*. The line of fit may not pass through any or all of the points in your line graph, but it will show the overall trend of the data that is graphed.

   a. **Drawing a line of fit.** Use the following keystrokes to draw a *line of fit* through your data points:

   2nd
   QUIT
   CLEAR — Returns the calculator to the home screen and clears it.

   STAT
   → — Displays the CALC menu
   4 — LinReg (ax+b) appears on the home screen as shown on the right




   2nd
   L1 — Selects L1 as the X data
   ,

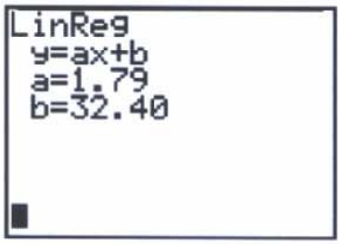
   2nd
   L2 — Selects L2 as the Y data
   ,

   VARS
   → — Displays the Y-Vars menu
   1 — Selects 1:Function
   1 — Stores the line of fit in Y1

   b. Your calculator screen should now look like the one shown below.

c. If your calculator screen looks like the one shown above, press **ENTER**. Otherwise press **CLEAR** and repeat step a.

d. The equation for the line of fit will be displayed on the screen in the form $y = ax + b$, where a is the slope and b is the y-intercept.



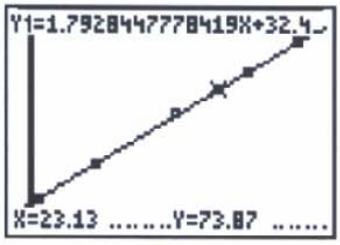

e. The equation for converting °C temperatures to °F determined experimentally is

°F = ___ °C + ____ .

7. To display the linear-regression curve on the °F *vs.* °C, press **GRAPH**.

8. Press **Y=** to view the equation for the line of fit .

9. Press **GRAPH** then **TRACE**. Press the **up arrow** then use ← and → to move along the line of fit. The X and Y coordinates of the cursor on the line of fit are displayed on the bottom of the calculator screen as shown below.




## EXTENSION

1. Use the following data to draw three more graphs, and then describe the relationship indicated by these graphs. (HINT: Only two are linear functions.)

| Data Set I | |
|---|---|
| L1 | L2 |
| 1 | 8 |
| 3 | 6 |
| 9 | 4 |
| 11 | 2 |

| Data Set II | |
|---|---|
| L1 | L2 |
| 1 | 1 |
| 3 | 5 |
| 6 | 7 |
| 9 | 10 |

| Data Set III | |
|---|---|
| L1 | L2 |
| 2 | 7 |
| 4 | 3 |
| 6 | 0 |
| 8 | 4 |
| 10 | 9 |