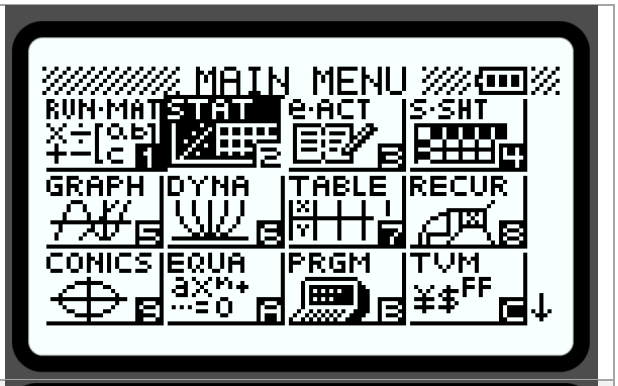
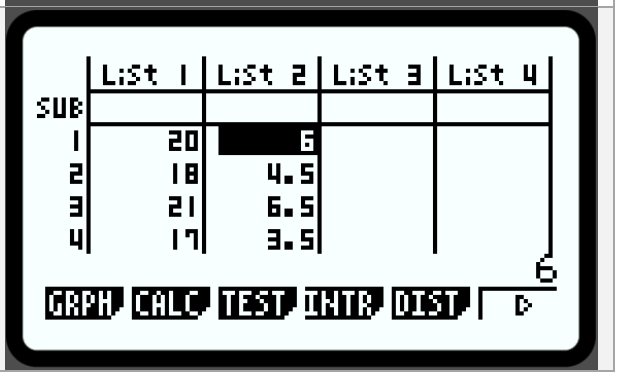
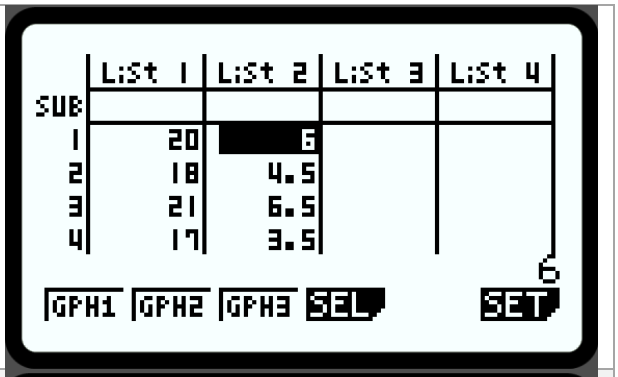
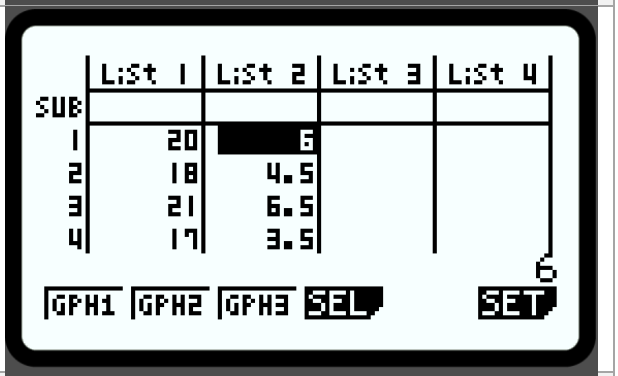
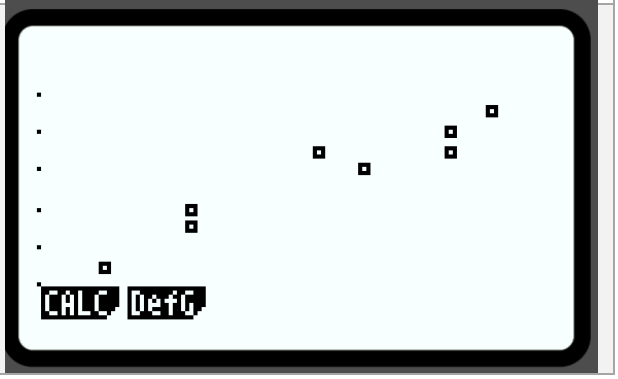
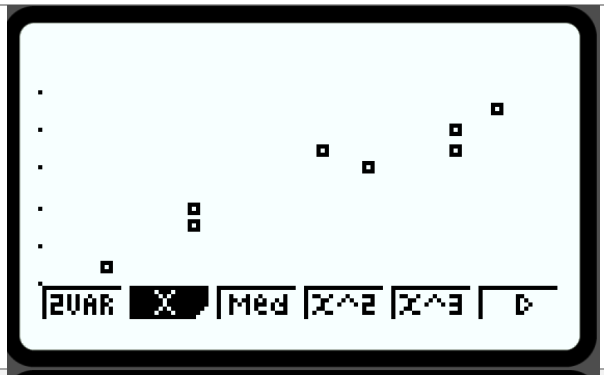
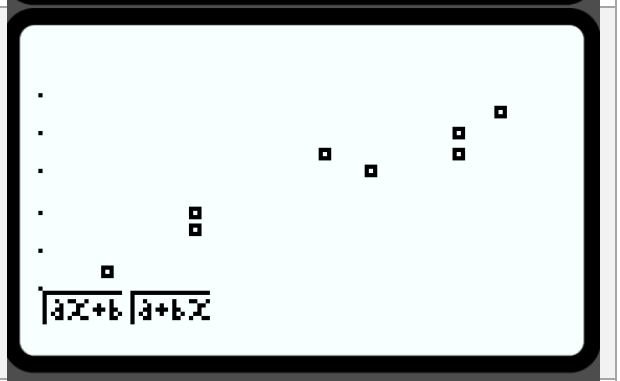
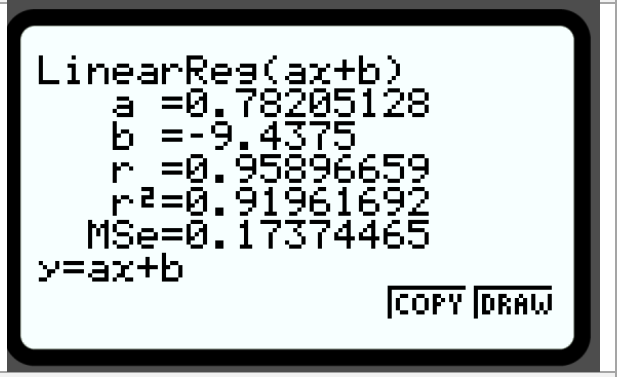
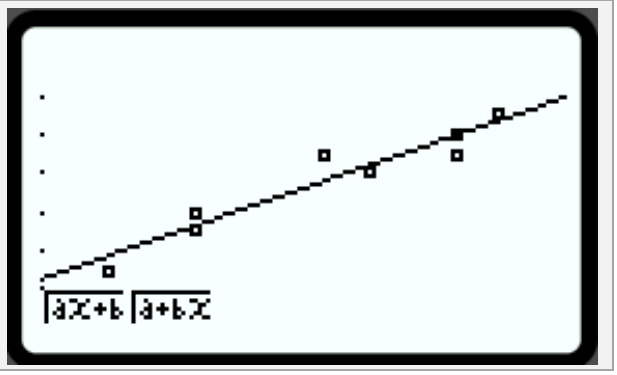
Unit 3: Two-Variable Statistics	
Spreadsheet Technology Required	Lessons 2, 3
Graphing Technology Recommended	Lessons 4, 5, 6
Graphing Technology Required	Lesson 8 Practice Problems: Lessons 5, 6, 7, 8, 9, 10

Lesson 5 – Graphing Scatter Plots and Determining Line of Best Fit.

(Example: IM Lesson 5.3: Fitting Lines with Technology)

1. First go to MENU, then press 2 – STAT.	
2. Insert the data into the table under **List 1** and **List 2**. To create a scatter plot from the Lists, press F1 – **GRPH**.	

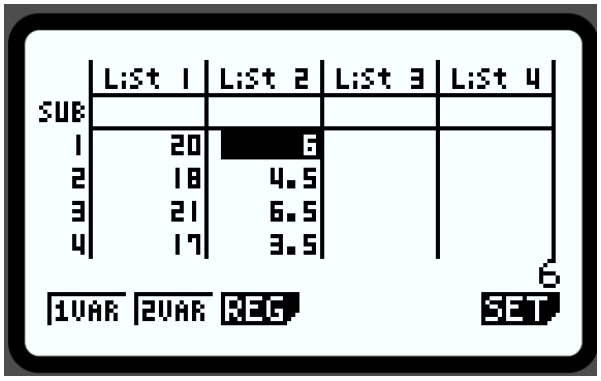
3. Then press [F6] – **SET**.	
4. In Graph Setup, we want to see: **Graph Type**: Scatter **XList**: List 1 **YList**: List 2 **Frequency**: 1 Press [EXE] when you are finished.	
5. When you are back at the Lists, now press [F1] – **GPH1** to view the scatter plot.	
6. Now you will see the scatter plot.	

7. There are two ways to find the equation of the line of best fit. From the graph, press **F1 – CALC**, then **F2 – X** . This will find a linear function to fit the data.	
8. Then press **F1 –** ax+b and your screen will show a list of values.	
9. Your screen now shows the values of **"*a*"** and **"*b*"** to create the equation along with **"*r*"**; the correlation coefficient.	
10. To view the line on your scatter plot, press **F6 – DRAW**.	

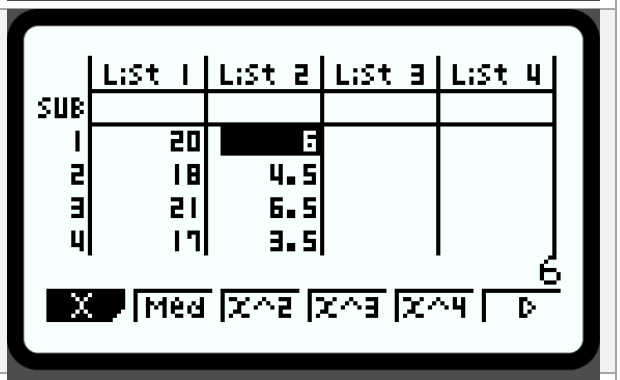
11. To find the equation of a line that best fits the scatter plot (from this set of points), you will need to go back (EXIT) to the **LISTS** screen.

    Then press F2 **– CALC**.

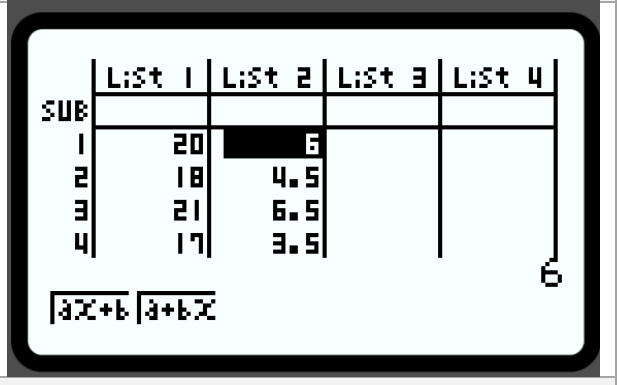
    You can use this method if you do not want to view the graph and only need the equation for the line of best fit.



12. From the previous screen, press F3 **– REG**.



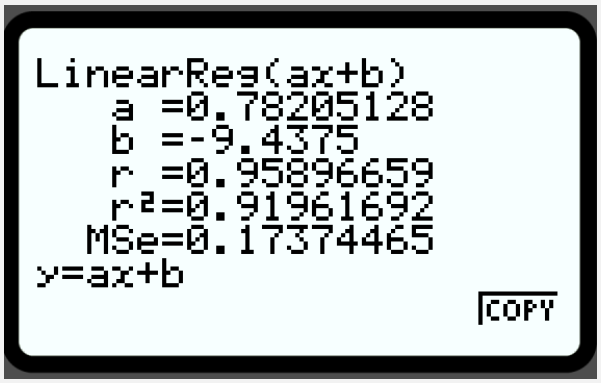
13. Now press F1 **– X**, then F1 **–** ax+b



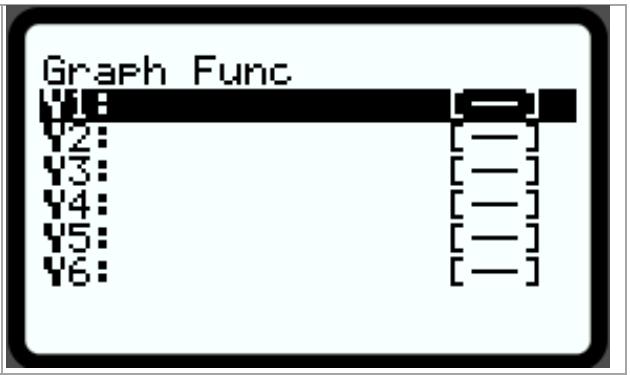
14. From this screen, you can see the **"*a*"** value which is the slope of the line of best fit. The **"*b*"** value is the y-intercept of the line of best fit.

So the equation for the line of best fit will be $y = 0.78x - 9.44$ (if rounded to the hundredths place)

You can copy the **exact** values of the line of best fit to plot onto the scatterplot. To do this, press F6 **– COPY**.



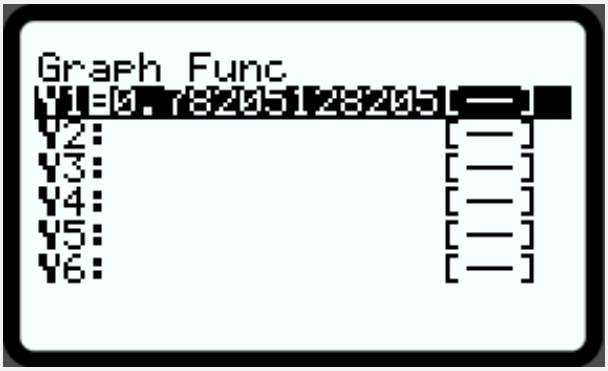
15. From this window, with **Y1** highlighted, press [EXE]. The exact values for **"*a*"** and **"*b*"** will be saved in **Y1** and you will return to the prior **LinearReg** window.



16. To verify that the values were saved, press [F6] **– COPY** again to return to the **Graph Func** window to view the exact values.

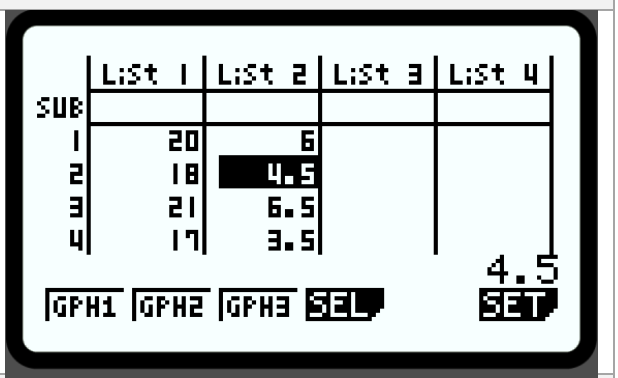
    Note: This equation of best fit can not be edited in this window. This equation will now be available in the Graph and Table Apps (where it could be edited if necessary).

    Press [EXE] to return to the **LinearReg** window.

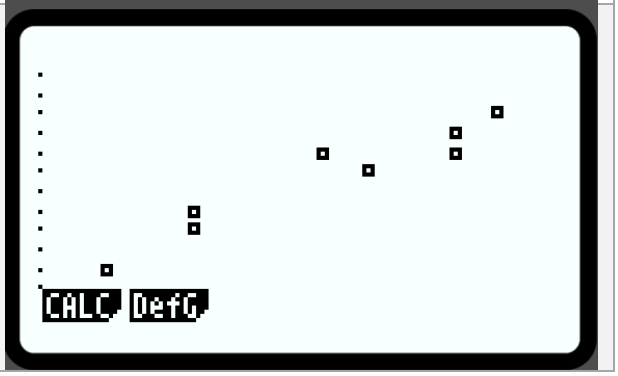


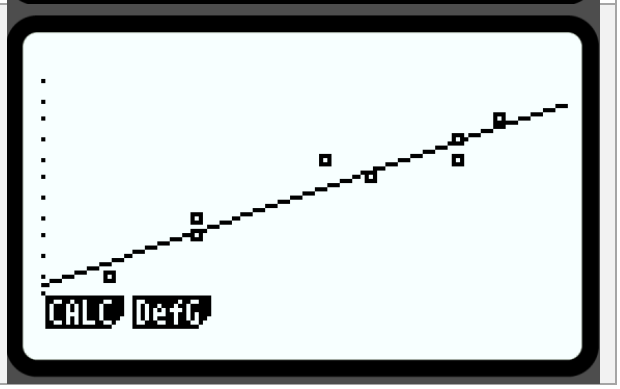
17. To return to your Data Lists, press [EXIT]. Press [EXIT] until **GRH1** appears for [F1].

    Now, press [F1] **– GPH1**.



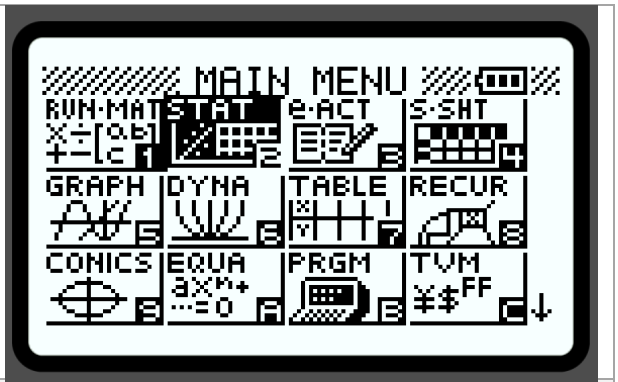
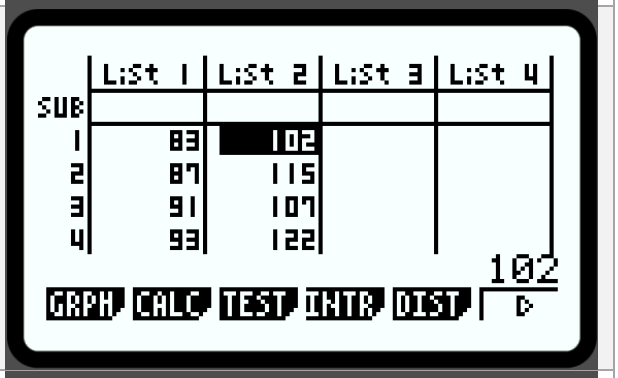
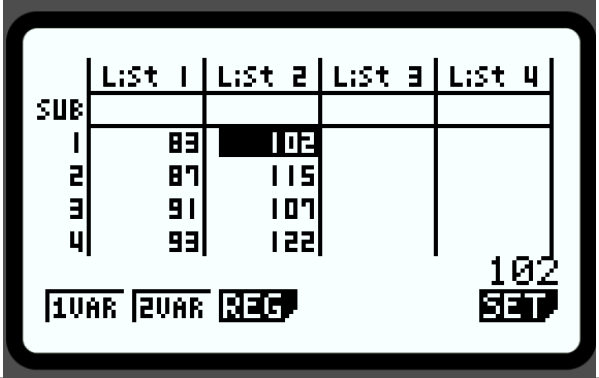
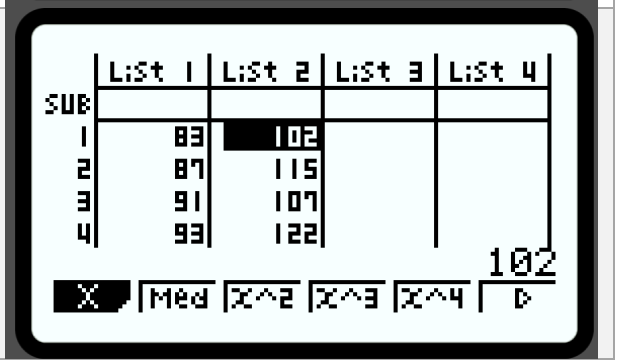
18. Press [F2] **– DefG**. This is a "quick" link to the **Define Graph** window.



19. The exact values will already be saved there. However, from this window you can edit these values if you are asked to round to a specific place value. You can also manually enter the equation here as well. The screen to the right shows the line of best fit entered rounded to the nearest hundredths. Press **F6 – DRAW** to see the line of best fit placed onto the scatter plot.	
20. Now you should see the scatter plot with the line of best fit.	

Lesson 5 - Finding the Equation for the Line of Best Fit

(Example: IM Lesson 5: Practice Problem #1)

1. First go to [MENU], then press [2] – [STAT].	
2. Insert the data into the table under **List 1** and **List 2.**	
3. To find the equation of a line that best fits the scatter plot (from this set of points), press [F2] – **CALC**.	
4. From the previous screen, press [F3] – **REG**.	

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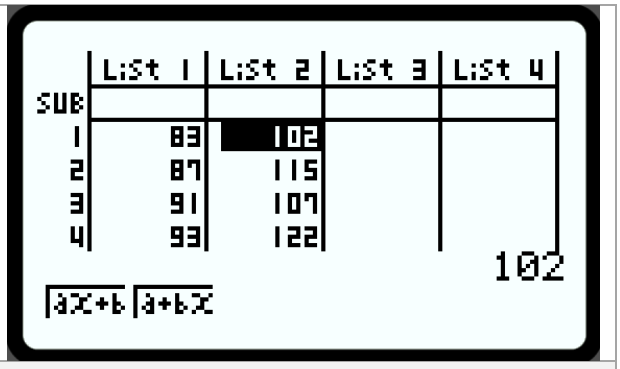
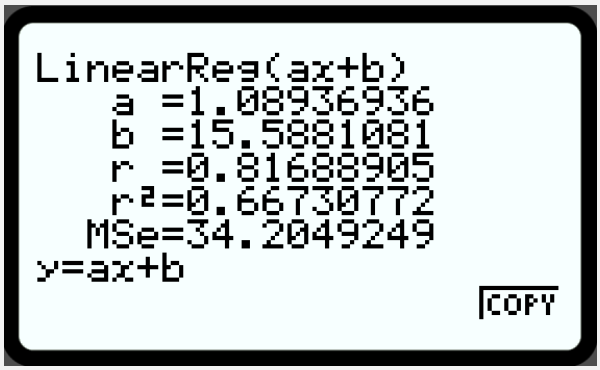
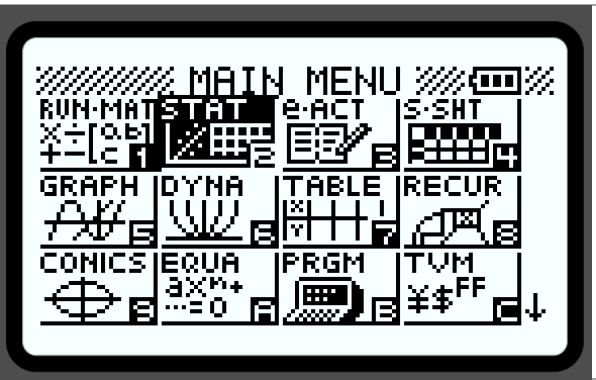
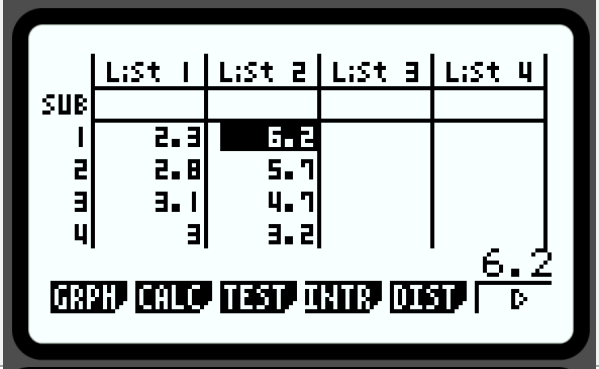
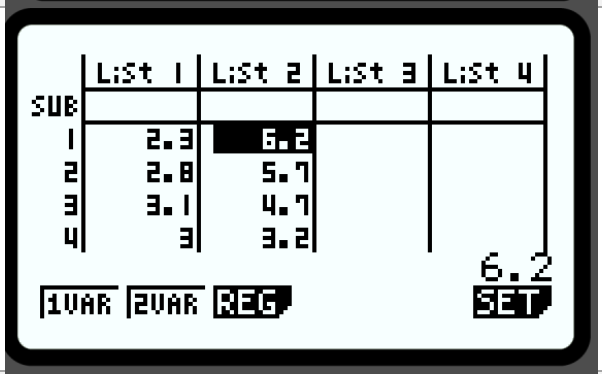
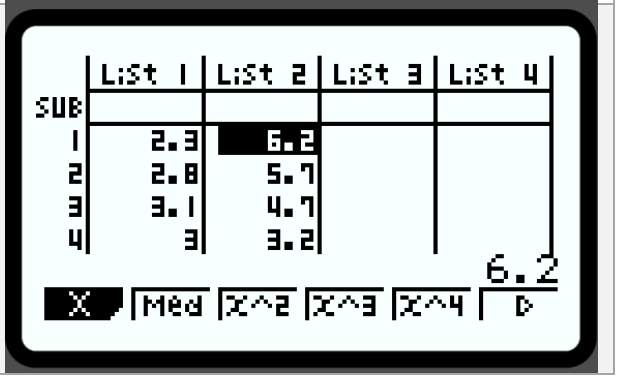
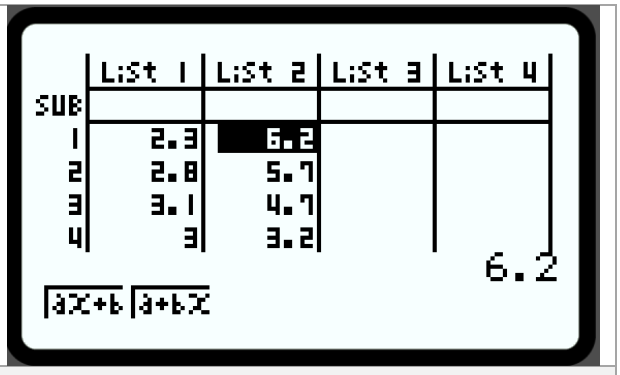
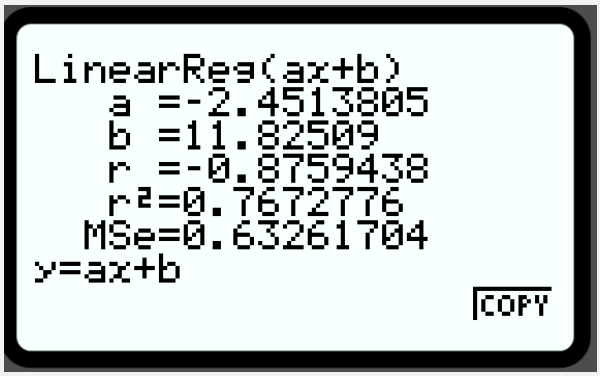
5. Now press F1 – X, then F1 – [aX+b].	
6. From this screen, you can see the **"*a*"** value which is the slope of the line of best fit. The **"*b*"** value is the y-intercept of the line of best fit. So the equation for the line of best fit will be $y = 1.09x + 15.59$ (if you round to the hundredths place)	

Lesson 5 - Finding the Equation for the Line of Best Fit

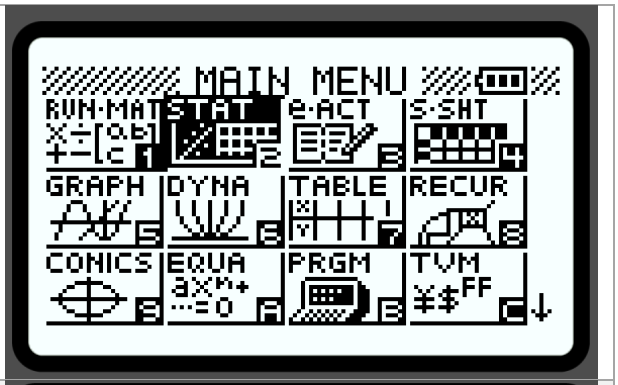
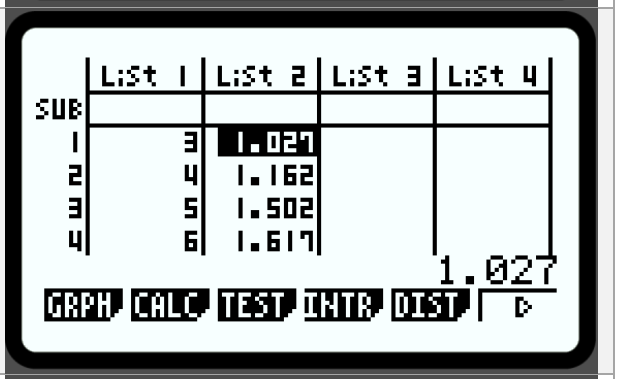
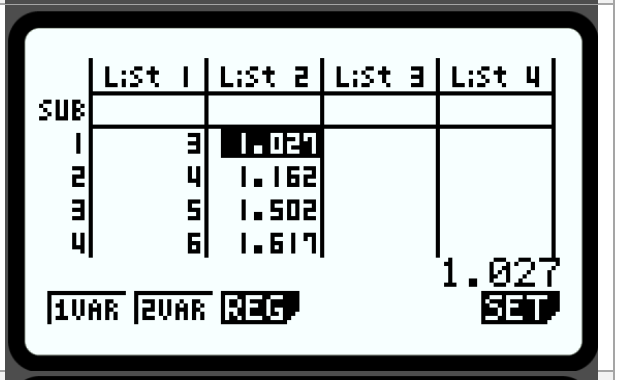
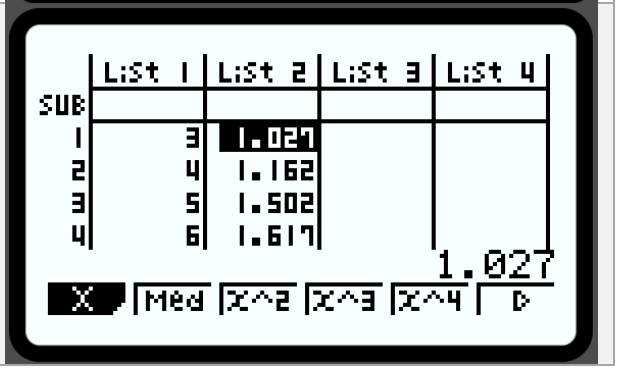
(Example: IM Lesson 5: Practice Problem #2)

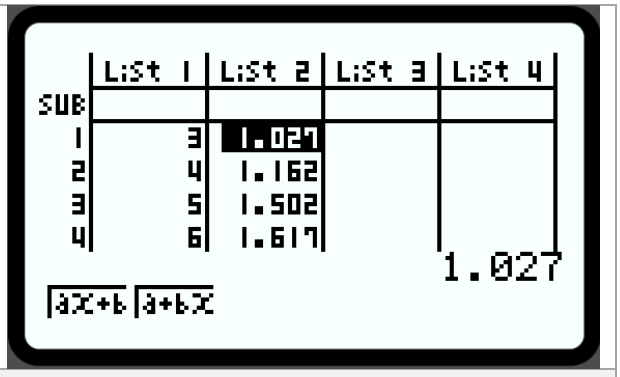
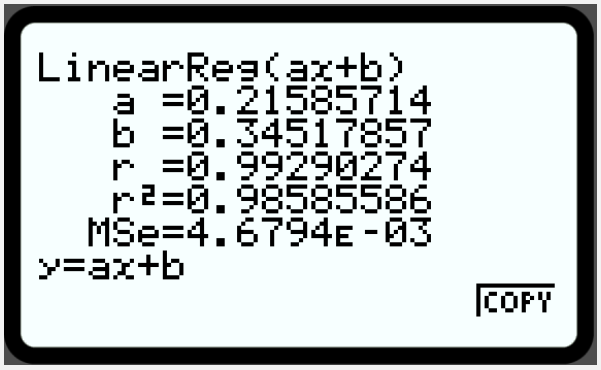
1. First go to [MENU], then press [2] – [STAT].	
2. Insert the data into the table under **List 1** and **List 2**	
3. To find the equation of a line that best fits the scatter plot (from this set of points), press [F2] – **CALC**.	
4. From the previous screen, press [F3] – **REG**.	

5. Now press F1 – X, then F1 – ax+b.	
6. From this screen, you can see the **"*a*"** value which is the slope of the line of best fit. The **"*b*"** value is the y-intercept of the line of best fit. So the equation for the line of best fit will be $y = -2.45x + 11.83$ (if you round to the hundredths place)	

Lesson 6 – Finding the Equation of the Line of Best Fit

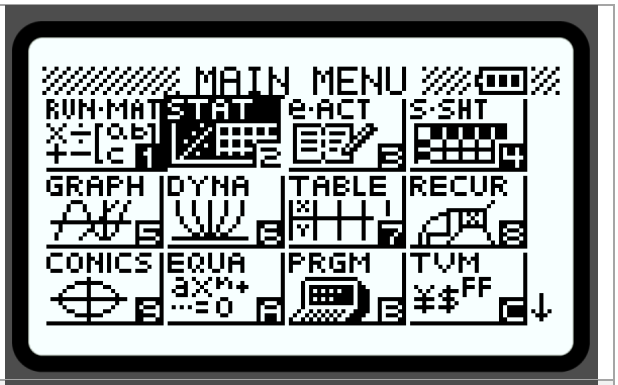
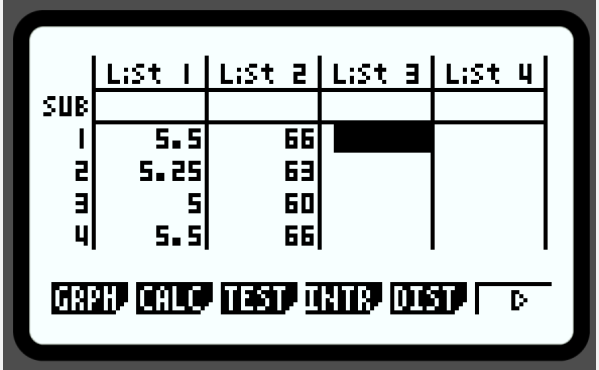
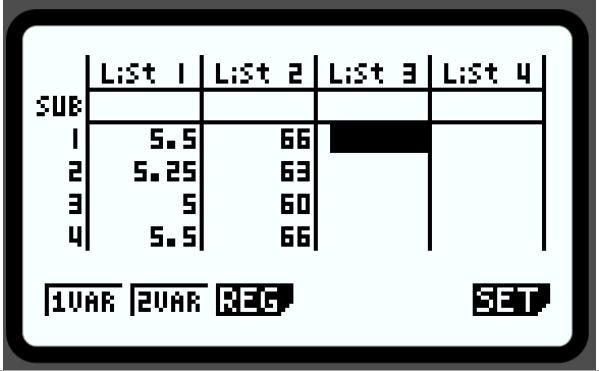
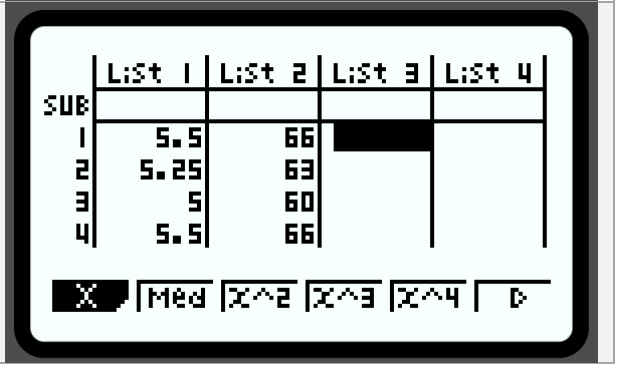
(Example: IM Lesson 6.2: Oranges Return)

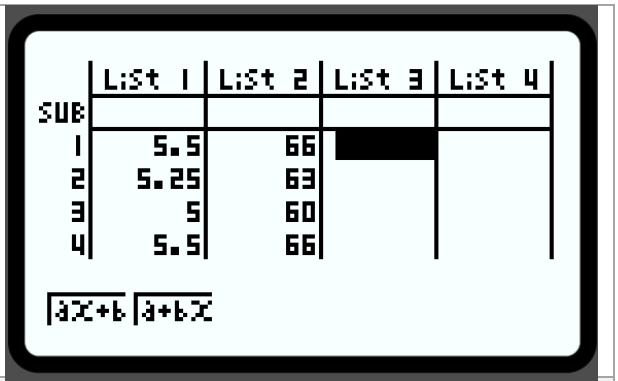
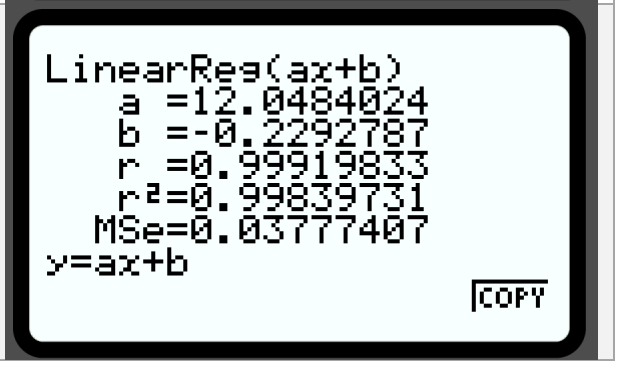
1. First go to MENU, then press 2 – STAT.	
2. Insert the data into the table under **List 1** and **List 2**	
3. To find the equation of a line that best fits the scatter plot (from this set of points), press F2 – **CALC**.	
4. From the previous screen, press F3 – **REG**.	

5. Now press F1 – X, then F1 – aX+b.	
7. From this screen, you can see the **"*a*"** value which is the slope of the line of best fit. The **"*b*"** value is the y-intercept of the line of best fit. So the equation for the line of best fit can be $y = 0.216x + 0.345$ (if you round to the thousandths place)	

Lesson 8 – Finding the Correlation Coefficient (R-Value) of a Data Set

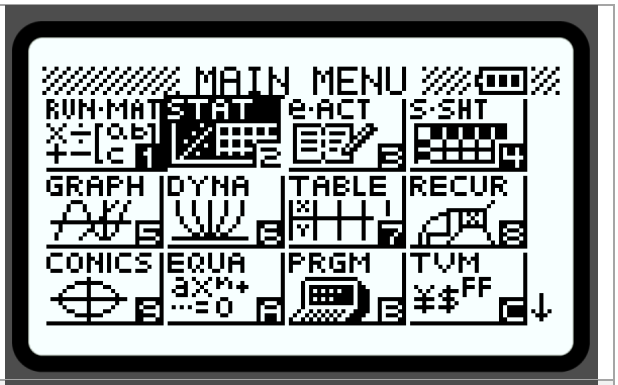
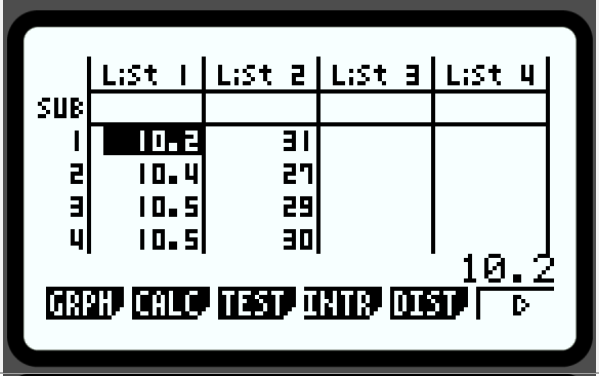
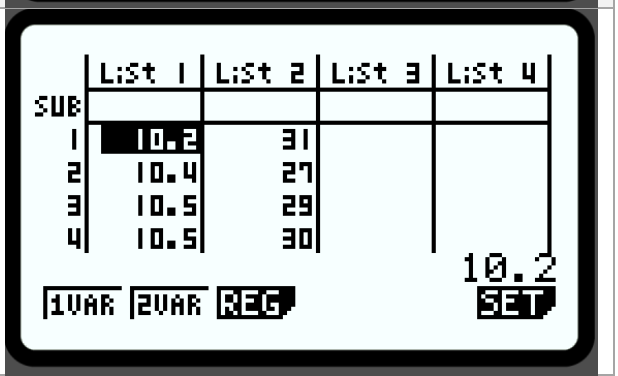
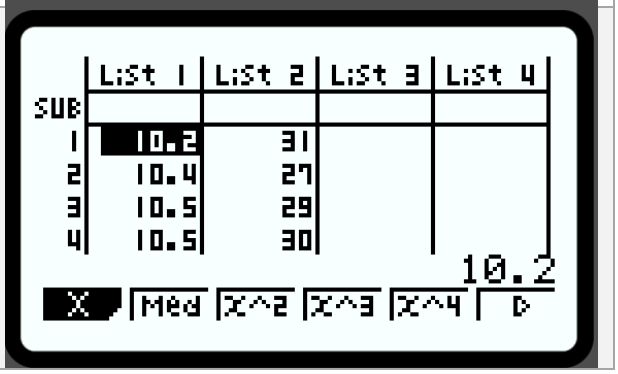
(Example: IM Lesson 8.2: Never Know How Far You'll Go)

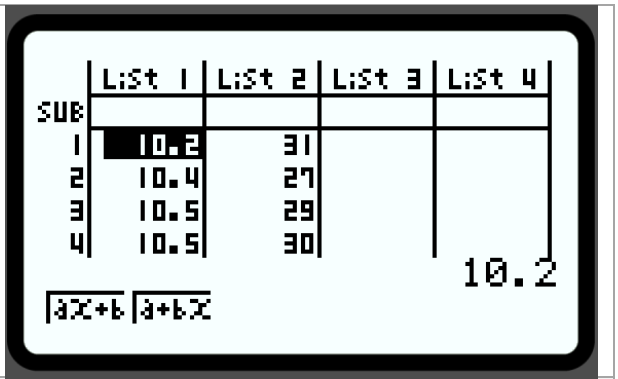
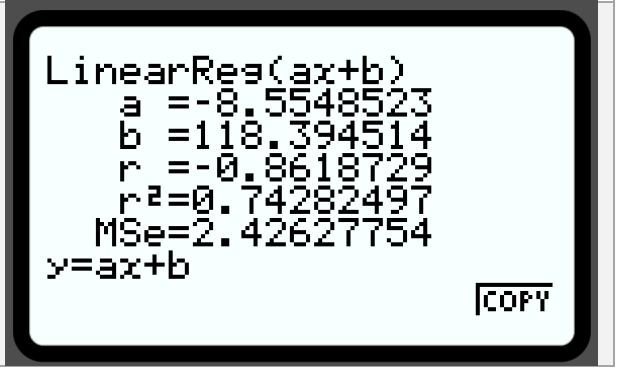
1. First go to [MENU], then press [2] – [STAT].	
2. Type the given data into **List 1** and **List 2**.	
3. To find the correlation coefficient, press [F2] – **CALC**.	
4. Then press [F3] – **REG** and on this screen press [F1] – **X**.	

5. Now press F1 – ax+b.	
6. You should see a list of variables and their values. The **correlation coefficient** is 0.999 (the **"*r*"** value). Since there is a direct correlation between the units, we expect there to be a strong, positive relationship between the variables.	

Lesson 9 – Using the R-Value to Determine Causal Relationships

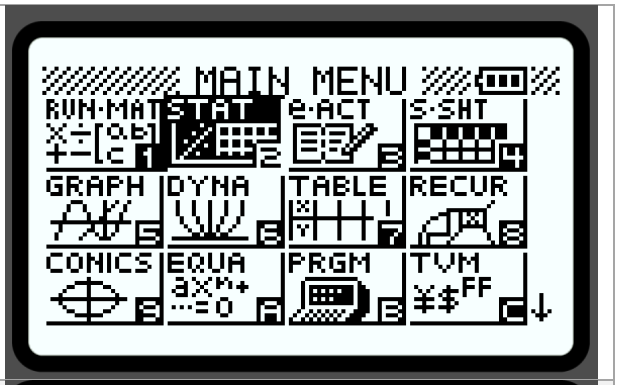
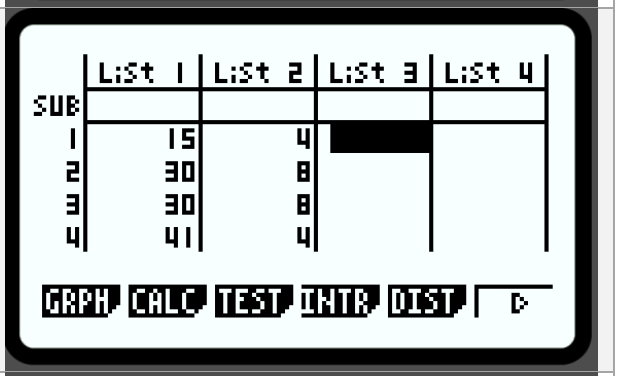
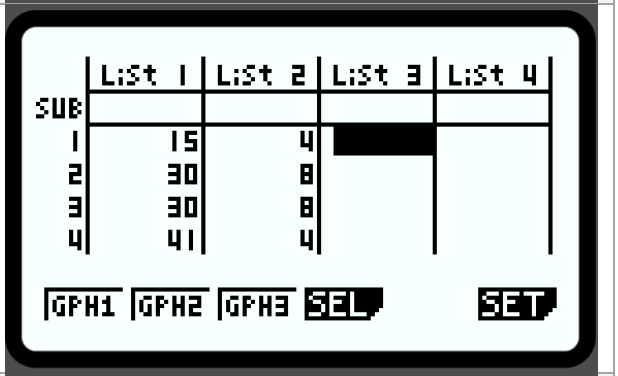
(Example: IM Lesson 9: Practice Problem #4)

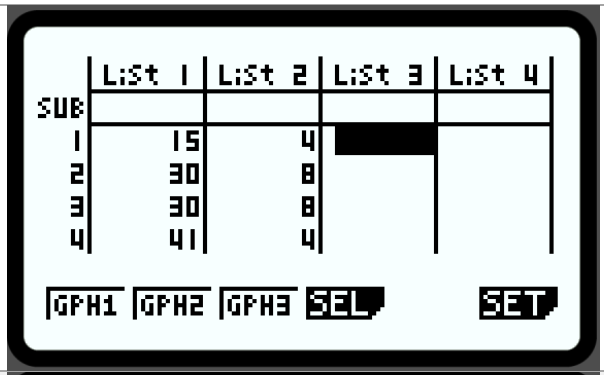
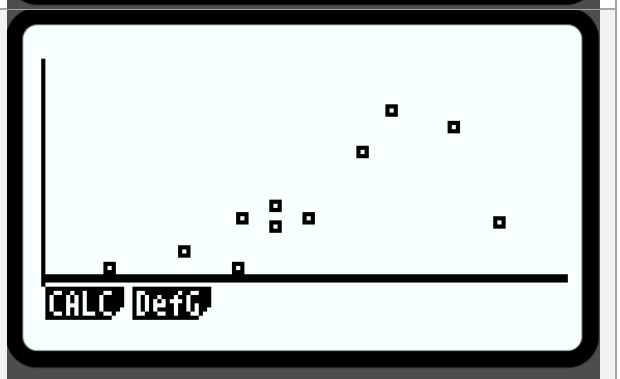
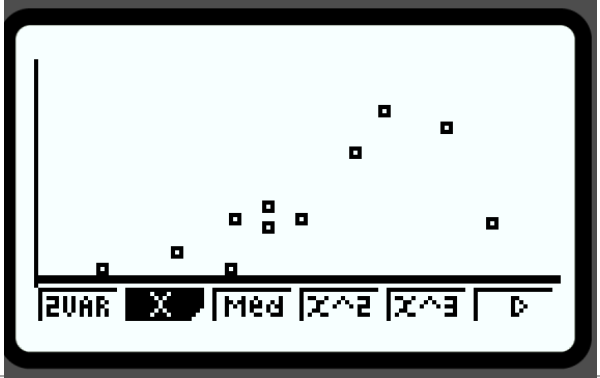
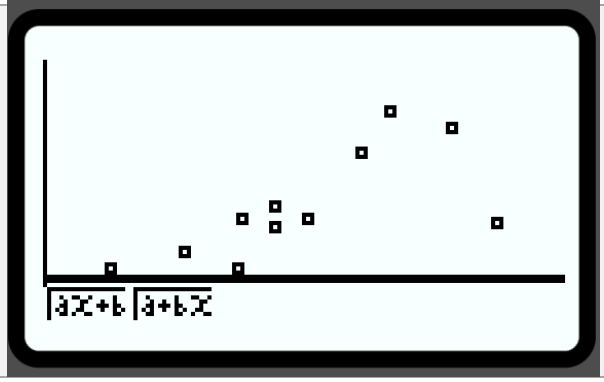
1. First go to MENU, then press 2 – STAT.	
2. Type the given data into **List 1** and **List 2**.	
3. To find the correlation coefficient, press F2 – **CALC**.	
4. Then press F3 – **REG** and on this screen press F1 – **X**.	

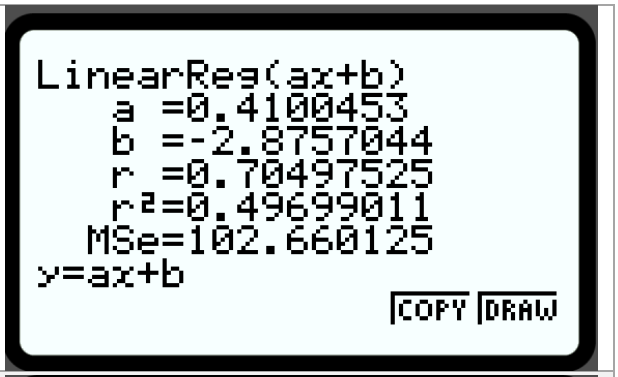
5. Now press **F1** – **ax+b**.	
6. You should see a list of variables and their values. Use the **"*a*"** and **"*b*"** values to create the equation for the line of best fit. The **correlation coefficient ("r" value)** has a value of **-0.86**; indicating a moderately strong negative correlation between the variables.	

Lesson 10 – Using Residuals and R-Value to Check Predictability

(Example: IM Lesson 10: Practice Problem #4)

1. First go to MENU, then press 2 – STAT.	
2. Type the given data into **List 1** and **List 2**.	
3. Press F1 – **GRPH**, then F6 – **SET**.	
4. Check to verify that the **"Graph Type"** says Scatter. Also, "**XList**" should be **List 1** and "**YList**" should be **List 2**.	

5. Press EXIT to return back to the **lists** screen, then press F1 – **GPH1**.	
6. You will now see the scatter plot.	
7. To find the line of best fit, press F1 – **CALC**.	
8. Now press F2 – **X,** followed by F1 – ax+b.	

9. You are now given all the values to create the equation for the line of best fit. To view the line of best fit graphed on the scatter plot, press **F6 – DRAW**.	
10. You can now see the scatter plot along with the data's line of best fit. Based on the given information, there is more variability as the temperature increases in this graph, which could be due to many factors (like rain or extreme temperatures), which means a linear model for this data is not appropriate. This conclusion would also be true considering the pattern in the residuals of this graph.