

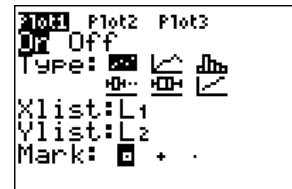
BUILDING UNDERSTANDING FOR A LINE OF BEST FIT

On Jose's 16th birthday he collected all the quarters in his family's pockets and placed them in a large jar. He decided to continue collecting quarters on his own. He counted the number of quarters in the jar periodically and recorded the data in a chart.

Jose's Savings								
Number of Months x	4	6	9	12	16	20	23	27
Number of Quarters y	290	295	396	440	622	704	820	850

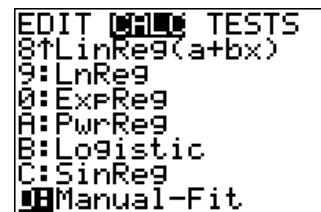
1. Make a paper graph of the data in this chart. Place the number of months on the x-axis and the number of quarters on the y-axis. Draw a straight line through the data that you believe represents how the data is changing. Try to have your line pass through two points on the graph.
2. Describe what your graph and line illustrate about what has taken place with Jose's collection of quarters since his 16th birthday.
3. On your graphing calculator

- ▶ Place the Number of Months in L1.
- ▶ Place the Number of Quarters in L2.
- ▶ Create an appropriate window for to view the data.
- ▶ Turn on a Scatter Plot as illustrated at the right.
- ▶ Press GRAPH.



4. How does your graph on the graphing calculator compare to your paper graph?
5. To find the line of best fit on the graphing calculator we will use a built in feature of the graphing calculator to draw a line.

- ▶ First notice what two points your hand drawn line of best fit passed through. You will be locating these on the calculator.
- ▶ Next press GRAPH. Then press STAT, move over to CALC and then locate the choice 0. Manual Fit as illustrated at the right. Press ENTER.
- ▶ When the calculator returns to the graph use the cursor arrows to navigate the cursor to one of the points from your hand drawn graph. When the cursor is on top of that point press enter. Then begin moving toward the other point. You will see a line being drawn. Continue to stretch the line and adjust the tilt of the line until it passes through the other point from the hand drawn graph.



- ▶ When you have reached the second point press ENTER. An equation will appear at the top of your screen. This is the equation for the line you have just drawn.
- ▶ To quit out of this manual-fit procedure you can press 2nd QUIT.

6. Press Y= to view the equation that represents your line. Write the equation:

Y = _____

7. This equation contains two numbers that are related to the situation described in the problem.

- ▶ The first number is the slope, or the coefficient on the x term. What is the slope of your line? What is the real world meaning of this number as it relates to this problem?
- ▶ The second number is the constant at the end of the equation. This number describes where the line crosses the y-axis. What is your y-intercept? What is the real world meaning for the y-intercept as it relates to this problem?

8. Use your equation to predict the number of quarters Jose will have on his 21st birthday. Explain how you predicted the number of quarters.

9. How much money will Jose have collected on his 21st birthday?

10. If Jose wants to collect \$100 in quarters how many quarters will he have to collect. Use your equation to predict when Jose will have collected \$100. Explain how you found your answer.