

## BUILDING UNDERSTANDING FOR $Y = B + MX$

On Jose's 16<sup>th</sup> 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 scatter plot of the data on your calculator. Describe any patterns you see in the table and/or graph.

2. Select two points that you believe represents the steepness of the line that would pass through the data.

(\_\_\_\_\_, \_\_\_\_\_) and (\_\_\_\_\_, \_\_\_\_\_)

Find the slope of the line between these two points.

3. Give a real world meaning to this slope.

4. Use the slope you found in question 3 to write an equation of the form  $y = mx$ . Graph this equation with your scatter plot. Describe how the line you graphed is related to the scatter plot.

What do you need to do with the line to have the line fit the data better?

5. Run the APPS TRANFRM on your graphing calculator. Change your equation to  $y=B+mx$ . Press WINDOW and move up to Settings. Change B to start at 0 and increase by steps of 10. Press GRAPH and notice that  $B=0$  is printed on the screen. Use the right arrow to increase the value of B. What happens to the graph as you increase the value of B.

6. Continue to increase or decrease the value of B until you have a line that fits the data. Write the equation for your line.

$Y =$  \_\_\_\_\_

7. What is the real world meaning for the y-intercept you located?

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

9. Use your equation to predict when Jose will have collected 1000 quarters. Explain how you found your answer.