

Section 5.8: Polynomial Models in the Real World Objective:
How to create a scatter plot on the TI-83 Plus graphing calculator

1. Turn Diagnostics On: 2nd 0, scroll down to Diagnostics On, push enter.
2. Press **Y=**, and clear out any equations that are already entered in the calculator.
3. Press 2nd, + (or **MEM**), 4, **ENTER**. The home screen should say “ClrAllLists DONE.”
4. Press **STAT**, and then **ENTER**. This is where you enter your information for the scatter plot.
5. Use the arrows to get to **L1**, the dotted line under L1 should be highlighted. Enter the first row or column of information, pressing **ENTER** after each of the entries.
6. Similarly, use the arrows to get to **L2**, again the dotted line under L2 should be highlighted, and enter the second row or column of information, pressing **ENTER** after each of the entries.
7. Once the entries are entered, press 2nd, **MODE** (or **QUIT**).
8. Press the **Y=** button. Use the **up** arrow to get to **PLOT1**. Press **ENTER** to highlight **PLOT1**. This allows your scatter plot to show up on your screen.
9. Press **ZOOM**, then 9. This is your scatter plot for the information that you entered.
10. Press 2nd, then **MODE** (or **QUIT**).
11. Press **STAT**, use the arrows to highlight **CALC**, then choose the appropriate regression type (4: LinReg, 5: QuadReg, 6: CubicReg). Press **ENTER**.
12. To get the equation into your y =, press the **y =** button. Then press **VARS**, 5: **STATISTICS**, right arrow twice to **EQ**, choose **1: RegEQ**.
13. Press **GRAPH** and you will see your scatter plot with the best-fitting line drawn as well.

To predict a missing or future value

- 1) Press 2nd **Window**.
- 2) Go to **TblStart =** and type in the value that you are predicting for.
- 3) Press 2nd **Graph**. Your solution will be the y value in the first row!

To clear each list

- 1) Press **STAT**, 1: **EDIT**.
- 2) Press the up arrow to **L1** and push **CLEAR**.
- 3) Press the up arrow to **L2** and push **CLEAR**.

L1 = top row, left column, or x-values

L2 = bottom row, right column, or y-values

*FOR PROBLEMS WITH 4 DIGIT YEARS, CHANGE THE FIRST VALUE TO 0. MAKE THE REST OF THEM BE THE NUMBER OF YEARS FROM WHEN YOU STARTED.

r = _____ and represents _____
 r² = _____ and represents _____

Example 1) Find a polynomial function whose graph passes through the set of points (-2, -4) and (8, 1)

Linear:

$$r^2$$

Quadratic:

$$r^2$$

Cubic:

$$r^2$$

Quartic:

$$r^2$$

Circle the equation that had the highest r^2 !

Example 2) Find a polynomial function whose graph passes through the set of points (-1, 8), (5, -4), and (7, 8)

Linear:

$$r^2$$

Quadratic:

$$r^2$$

Cubic:

$$r^2$$

Quartic:

$$r^2$$

Circle the equation that had the highest r^2 !

Section 5.8: Polynomial Models in the Real World

Objective:

Example 3) Find a cubic and a quartic model for each set of values. Explain why one models the data better.

x	-2	-1	0	1	2
y	-65	-14	-4	2	90

Cubic:

$$r^2$$

Quartic:

$$r^2$$

Circle the equation that had the highest r^2 !

Example 4) Find a polynomial function whose graph passes through the points: (-3, -50), (-2, -4), (-1, 10), (0, 7), and (2, -23)

Cubic:

$$r^2$$

Quartic:

$$r^2$$

Circle the equation that had the highest r^2 !

Example 5) The table below shows the percentage of the U.S. labor force in unions for selected years between 1955 and 2005.

Year	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
%	33.2	31.4	28.4	27.3	25.5	21.9	18.0	16.1	14.9	13.5	12.5

a) Find a polynomial model that matches the data.

Linear:

$$r^2$$

Quadratic:

$$r^2$$

Cubic:

$$r^2$$

Quartic:

$$r^2$$

b) Use the model that you found to predict the percent of the labor force in the unions in the year 2020.