

Math 1314
College Algebra
Lab Exercise # 4
Ms. Prescott

Name: _____

Date: _____

Section: _____

Semester: _____

Grade: _____

Attach computer printouts to this sheet and submit your assignment to your instructor.

The function $y = ax^3 + bx^2 + cx + d$ can be used to estimate the number of bachelor's degrees (y) conferred in mathematics (x) years after 1970, where $0 \leq x \leq 20$.

- 4a. Use the following four data pairs (x, y) to construct a 4 x 5 system by substituting the appropriate values into the given function: (5, 14685), (10, 13140), (15, 15095), and (20, 15150). Print the 4 x 5 augmented matrix formed from the system.)

- 4b. Use the rref feature of the calculator to determine a, b, c, and d, print the matrix solution, and then write the particular function models that data using the a, b, c, and d values.

- 4c. Print a graph of the particular function from $x = 0$ to $x = 30$.

- 4d. Trace and print verification that the four data points are on the graph of the particular function.

- 4e. Explain, based on the graph's shape, why is it not a good model when $x > 20$

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*****If in doubt, Print it out!*****

4a) First, you need to plug in each point for the given equation. For example:

$a(5^3)+b(5^2)+c(5)+d(1)=14685$. Do this for the remaining 3 points. Notice that the value with d is always 1. Now go to [MATRX], then EDIT, press [ENTER]. (Make sure to remember which matrix you selected, A, B, C...) You are going to create a 4 x 5 matrix, enter in 4, [ENTER], the 5 [ENTER]. Then enter each value that you figured out for each point. You have to press [ENTER] after each number, the first line will read: [125 25 5 1 14685]. When done hit [2nd] [[MODE]. To recall you matrix press, [MATRX], then select the matrix you built and press [ENTER]. Print the screen, then scroll right and print the screen again.

4b) To find the reduced row echelon form of this matrix. Press [MATRX], scroll to MATH, the scroll down to B: rref(. Then press [MATRX], select the matrix you built, close your parentheses and hit [ENTER]. Print the left side then scroll over and print eh right hand side on the matrix as well. The final column gives you the values of a, b, c, and d of the given equation.

4c) Enter the equation in your equation editor. Graph your equation with an xmin of 0 and the xmax of 30. You may have to adjust the ymin and ymax accordingly.

4d) Use the [TRACE] key and scroll to find the 4 original points given to you in 4a.

4e) No guidance needed.