

(10pts) NAME (printed neatly): \_\_\_\_\_

(5pts) Section Number (circle correct section): 503 (10:20am) 521 (11:30am) 523 (1:50pm)

Quiz Grade: \_\_\_\_\_

1. The table shows the average SAT score for certain years. Find the best fitting line for the data where  $t$  is the number of years after 1995 and  $y$  is the SAT score.

$t$	10	9	7	5	3	L1
Year	2005	2004	2002	2000	1998	
SAT Score	1028	1026	1020	1019	1017	L2

- a. (5pts) What is the calculator command you are to write down that shows your work when doing linear regression?

**LinReg L<sub>1</sub>, L<sub>2</sub>, Y<sub>1</sub>**

- b. (10pts) What is the best fitting line?

$$y = 1.585365854t + 1011.219512$$

- c. (10pts) Using the line of best fit, in what year would you expect an average SAT score to be 1030?

$$Y_2 = 1030$$

(the window had to be adjusted to see the intersection point; one appropriate window would be [0, 15] by [1010, 1040])

Intersect (11.846154, 1030)

$1995 + 11.846154 = 2006.846154$  so the year would be **2006**

- d. (10pts) Using the line of best fit, what would you predict the average SAT score to be in the year 1996?

$$Y_1(1996 - 1995) \text{ or } Y_1(1) = 1012.804878$$

In 1996, the best fitting line would predict an average SAT score of **1013**.

- e. (5pts) What is the correlation coefficient?

$$r = 0.957073226$$

2. (10pts) A farmer has  $x$  acres of corn,  $y$  acres of peanuts and  $z$  acres of soybeans planted. Write an equation that represents that the number of acres of soybeans is three times the number of acres of corn and peanuts combined.

$$z = 3(x + y) \quad \text{OR} \quad z = 3x + 3y \quad \text{OR} \quad -3x - 3y + z = 0$$

3. The matrix  $\left[ \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 2 & 4 & 4 \\ 0 & 0 & 1 & 0 \end{array} \right]$  represents a system of equations.

a. (10pts) What is the next Gauss-Jordan row operation needed? Give the matrix that would result from performing this Gauss-Jordan row operation.

$$\frac{1}{2}R_2$$

$$\left[ \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 0 & 1 & 0 \end{array} \right]$$

b. (10pts) After performing the Gauss-Jordan row operation needed in part *a*, what is the next and final Gauss-Jordan row operation?

$$-2R_3 + R_2 \rightarrow R_2$$

c. (10pts) Give the solution, if it exists, as a point which represents the solution to this system of equations. If the solution does not exist, write “no solution.”

Since the final matrix is  $\left[ \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 0 \end{array} \right]$ , the solution is **(1, 2, 0)**.

5 points for this section of name, section and first letter of last name. NAME: \_\_\_\_\_

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First Letter of Last Name:

A-D E-K L-R S-Z