

Name _____
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Math 2250-4
Quiz 5
February 8, 2013

1a) Consider the following system of equations

$$2x + y + 3z = 1$$

$$3x + 3z = 2$$

$$-x - 2y - 3z = 0$$

Exhibit the augmented matrix corresponding to this system, compute its reduced row echelon form, and find the solution set to the system.

(5 points)

1b) Interpreting the solution set of each single equation above as a plane in \mathbb{R}^3 , what geometric configuration corresponds to the solution set of the system of 3 equations above?

(2 points)

2) Consider the matrix equation

$$\begin{bmatrix} 1 & -2 & 3 & 4 \\ 5 & -2 & 7 & 3 \\ 3 & 2 & 1 & -5 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix}$$

with $\underline{b} \neq \underline{0}$. Without trying to find the solution set explicitly, explain which of the following three outcomes are possible for the solution set, just based on the number of equations, the number of unknowns, and the right hand side: (a) no solutions; (b) exactly one solution; (c) infinitely many solutions.

(3 points)