

Math 250

Name (Print): _____

Fall 2013

Quiz 2

1. (5 pts) The reduced row echelon form of the augmented matrix of a system of linear equations is given. Determine whether the system is consistent, if so, find its general solution in vector form.

$$\begin{bmatrix} 1 & 0 & 0 & -3 & 0 \\ 0 & 1 & 0 & -4 & 0 \\ 0 & 0 & 1 & 5 & 0 \end{bmatrix}$$

Answer:

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = c \begin{bmatrix} 3 \\ 4 \\ -5 \\ 1 \end{bmatrix}, \text{ where } c \text{ is a scalar.}$$

2. (5pts) Find the rank and nullity of the given matrix. Justify the answer by either giving the REF or RREF form of the matrix. Write on the back of this page if you run out of space.

$$\begin{bmatrix} -2 & 2 & 1 & 1 & -2 \\ 1 & -1 & -1 & -3 & 3 \\ -1 & 1 & -1 & -7 & 5 \end{bmatrix}$$

Answer: The RREF form is

$$\begin{bmatrix} 1 & -1 & 0 & 2 & -1 \\ 0 & 0 & 1 & 5 & -4 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

Therefore the rank is 2 and the nullity is $5 - 2 = 3$.