MATH 205A,B - LINEAR ALGEBRA
WINTER 2013

QUIZ 1

NAME: **Section:**(Circle one) A B

Show ALL your work CAREFULLY.

Consider the following matrix

$$A = \begin{bmatrix} 1 & -2 & -1 & 3 \\ 3 & -6 & -2 & 2 \end{bmatrix}.$$

(a) Find the reduced row echelon form of the matrix A. Make sure you show the row operations you use.

The reduced row echelon form of A can be obtained as follows.

$$\begin{bmatrix} 1 & -2 & -1 & 3 \\ 3 & -6 & -2 & 2 \end{bmatrix} \xrightarrow{\text{(i)}} \begin{bmatrix} 1 & -2 & -1 & 3 \\ 0 & 0 & 1 & -7 \end{bmatrix} \xrightarrow{\text{(ii)}} \begin{bmatrix} 1 & -2 & 0 & -4 \\ 0 & 0 & 1 & -7 \end{bmatrix}$$

where (i) is the row operation *add* $(-3)\cdot$ *(first row) to (second row)* **and (ii) is the row operation** *add (second row) to (first row)*.

(b) Find the general solutions of the system whose augmented matrix is given by A.

Based upon the reduced row echelon form of A obtained in part (a), we conclude that

$$x_1 = 2x_2 - 4; x_2 \textbf{ is a free variable } ; x_3 = -7.$$

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