Math 4160 - Quiz 1

Name:_____

For the following show all work clearly.

1. Find the Solution set for the following systems of liner equations

(a) $\begin{cases} 2x_1 & -x_2 & +4x_3 & = 2 \\ & & x_3 & = 0 \\ x_1 & -x_2 & +2x_3 & = 6 \end{cases}$

(b) $\begin{cases} x_1 & +4x_2 & +7x_3 & = 2 \\ 2x_1 & +5x_2 & +8x_3 & = 0 \\ 3x_1 & +6x_2 & +9x_3 & = 0 \end{cases}$

(c) $\begin{cases} 2x_1 & -2x_2 & +4x_3 & & -6x_5 & = 2 \\ & & x_3 & +6x_4 & & = 0 \\ x_1 & -x_2 & +2x_3 & +x_4 & +x_5 & = 0 \end{cases}$

2. Find the inverses (if they exist) for the following matrices. If they do not exist state why.

$A = \begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$ $B = \begin{bmatrix} 4 & 0 & -1 \\ -1 & 2 & 0 \\ 3 & 2 & 0 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 1 & 0 \\ -1 & 1 & 1 \\ 1 & 5 & 3 \end{bmatrix}$

3. Solve the following systems of linear equations using matrices $A\mathbf{x} = \mathbf{b}$.

(a) $\begin{cases} 2x_1 & -5x_2 & = 2 \\ x_1 & -3x_2 & = 2 \end{cases}$

(b) $\begin{cases} x_1 & -2x_2 & & = -3 \\ & 3x_2 & +x_3 & = 9 \\ & x_2 & +x_3 & = 5 \end{cases}$