Math 322 Names:_____

January 19, 2017

1. Consider the system of equations

$$\begin{aligned} -3x_1 + 2x_2 - 4x_3 + x_4 &= -5 \\ 7x_1 + 2x_3 - 6x_4 &= 11 \end{aligned}$$

Express the system

a. as an augmented matrix.

b. as a vector equation.

c. as a matrix equation.

2. Solve the system in question 1. Give a parametric expression of your solutions.

3. Is the vector $\begin{bmatrix} -5 \\ 0 \\ 2 \end{bmatrix}$ a linear combination of the vectors $\mathbf{u} = \begin{bmatrix} -1 \\ 3 \\ 1 \end{bmatrix}$ and $\mathbf{v} = \begin{bmatrix} 1 \\ 2 \\ 0 \end{bmatrix}$? Show steps and justification clearly.

4. Do the vectors $\mathbf{u}$ and $\mathbf{v}$ in question 3 span a line, a plane, or all of $\mathbb{R}^3$? Explain.