Quiz 5

MATH 221-02

March 4, 2015 Chapter 3.

Let $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$ (from problem #21b in section 3.4).

1. Solve the equation $A\mathbf{x} = \mathbf{b}$ for $\mathbf{b} = \begin{bmatrix} 4 \\ 4 \end{bmatrix}$. SHOW YOUR WORK!

2. How many solutions are there to $A\mathbf{x} = \mathbf{b}$?

3. Write the solution as a particular plus a null solution, $\mathbf{x}_p + \mathbf{x}_n$.

4. If possible, write the RHS $\mathbf{b} = \begin{bmatrix} 4 \\ 4 \end{bmatrix}$ as a linear combination of the columns of A? If not possible, explain why.

5. Based on your answer to #4, explain whether or not $\mathbf{b}$ is in $C(A)$.

6. Find the dimensionality of the domain of $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$. Explain why your answer is correct.

7. Find the dimensionality of the range or column space of $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$, $C(A)$. Show or explain why your answer is correct.

8. For $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$, show that the range (or column space) $C(A)$ is a vector space. SHOW YOUR WORK!