Math02B Assignment 4.2 Last Name_______________1st_________

Give complete solutions to the following problems. Be sure to provide all the necessary steps to support your answers.

1. Determine ifw is in Nul (A) , where

$$w = \begin{bmatrix} 1 \\ 3 \\ -4 \end{bmatrix}, A = \begin{bmatrix} 3 & -5 & -3 \\ 6 & -2 & 0 \\ -8 & 4 & 1 \end{bmatrix}$$

2. Either use an appropriate theorem to show that the given set, W, is a vector space, or find a specific example to the contrary.

$$\left\{ \begin{bmatrix} a \\ b \\ c \end{bmatrix} : a+b+c=2 \right\}$$

3. Find a nonzero vector in Nul(A) and a nonzero vector in Col(A).

$$A = \begin{bmatrix} 7 & -2 & 0 \\ -2 & 0 & -5 \\ 0 & -5 & 7 \\ -5 & 7 & -2 \end{bmatrix}$$

4. Determine whether **w** is in the column space of A, the null space of A, or both, where

$$w = \begin{bmatrix} 1 \\ 2 \\ 1 \\ 0 \end{bmatrix}, A = \begin{bmatrix} -8 & 5 & -2 & 0 \\ -5 & 2 & 1 & -2 \\ 10 & -8 & 6 & -3 \\ 3 & -2 & 1 & 0 \end{bmatrix}$$

5. Find an explicit description of Nul(A) by listing vectors that span the null space.

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

6. Find A such that the given set is Col(A).

$$\left\{ \begin{bmatrix} 2s+3t \\ r-s-2t \\ 4r+2 \\ 3r-s-t \end{bmatrix} : \text{r,s and t are real} \right\}$$