MA322-007 Mar 10 Quiz Name:_____

For each question, explain why your answer works.

4.3: Find five vectors that are in the null space of $A = \begin{bmatrix} 1 & 0 & 0 & 2 & 3 & 4 \\ 0 & 1 & 0 & 5 & 6 & 7 \\ 0 & 0 & 1 & 8 & 9 & 0 \end{bmatrix}$

4.3 Which of the following vectors are in the column space of
$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 2 & 3 & 4 \\ 5 & 6 & 7 \\ 8 & 9 & 0 \end{bmatrix}$: $\vec{\mathbf{v}}_1 = \begin{bmatrix} 1 \\ -1 \\ 0 \\ -1 \\ -1 \\ -1 \end{bmatrix}$, $\vec{\mathbf{v}}_2 = \begin{bmatrix} 1 \\ 0 \\ -1 \\ -2 \\ -2 \\ 8 \end{bmatrix}$, $\vec{\mathbf{v}}_3 = \begin{bmatrix} 1 \\ -1 \\ 0 \\ 1 \\ 2 \\ 3 \end{bmatrix}$?

HW#1. Is $\vec{\mathbf{v}} = \begin{bmatrix} 1 \\ 3 \\ -4 \end{bmatrix}$ in $\mathrm{Nul}(A)$ if $A = \begin{bmatrix} 3 & -5 & -3 \\ 6 & -2 & 0 \\ -8 & 4 & 1 \end{bmatrix}$?

HW#5. Find a matrix B so that $\mathrm{Nul}(A) = \mathrm{Col}(B)$ for $A = \begin{bmatrix} 1 & -4 & 0 & 2 & 0 \\ 0 & 0 & 1 & -5 & 0 \\ 0 & 0 & 0 & 0 & 2 \end{bmatrix}$.

HW#7. Is $\left\{ \begin{bmatrix} a \\ b \\ c \end{bmatrix} : a+b+c=2 \right\}$ a subspace?

HW#9. Is $\left\{ \begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix} : \begin{array}{rcl} a-3b & = & 4d, \\ 2a = d+5c & & \end{array} \right\}$ a subspace?

HW#11. Is $\left\{ \begin{bmatrix} x-2y \\ 3+3x \\ 3x+y \\ 2x \end{bmatrix} : x, y \in \mathbb{R} \right\}$ a subspace?

HW#13. Is $\left\{ \begin{bmatrix} x-6y \\ y \\ x \end{bmatrix} : x, y \in \mathbb{R} \right\}$ a subspace?