Day 5

(1) Assuming $\begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix} \in N(A)$ and

$\begin{bmatrix} 5 \\ 1 \\ 7 \end{bmatrix}$ is a solution to $LS(A, \vec{b})$,

find three other solutions to $LS(A, \vec{b})$.

(2) If $LS(A, \vec{b}) \neq \emptyset$, then $\vec{b}$ is _____ columns of A.

(3) If $LS(A, \vec{b}) = \emptyset$, then $\vec{b}$ is _____ columns of A.

For (2) & (3), fill in the blank.

(4) Given $A = \begin{bmatrix} 1 & 0 & 3 & 0 & 4 & 0 \\ 0 & 1 & -3 & 0 & 7 & 0 \\ 0 & 0 & 0 & 1 & 9 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$,

express $N(A)$ as a span of two vectors.

(5) Express $\left\langle \left\{ \begin{bmatrix} 1 \\ 2 \\ 4 \end{bmatrix}, \begin{bmatrix} 2 \\ 3 \\ 5 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \\ 6 \end{bmatrix}, \begin{bmatrix} 4 \\ 5 \\ 7 \end{bmatrix} \right\} \right\rangle$

as a span of two vectors.

(6) Is $\begin{bmatrix} 5 \\ 0 \end{bmatrix} \in \left\langle \left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 2 \end{bmatrix}, \begin{bmatrix} 3 \\ 3 \end{bmatrix} \right\} \right\rangle$?

Explain why or why not.