

key

QUIZ 15

For the following questions, let A be the matrix given below.

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

1. (2 points) If the null space of A is a subspace of \mathbb{R}^k , what is k?

4

2. (2 points) Find a vector in $\text{Nul}(A)$.

$\vec{0}$

3. (2 points) Is $u = \begin{bmatrix} 1 \\ 8 \\ 1 \\ 1 \end{bmatrix}$ in $\text{Nul}(A)$?

$$Au = \begin{bmatrix} 1 & 0 & 1 & -2 \\ 3 & 2 & 1 & 0 \\ -4 & 1 & -5 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 8 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 20 \\ 0 \end{bmatrix} \neq \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

No

4. (2 points) If the column space of A is a subspace of \mathbb{R}^k , what is k?

3

5. (2 points) Find a non-zero vector in $\text{Col}(A)$.

$$\begin{bmatrix} 1 \\ 3 \\ -4 \end{bmatrix}$$

6. (2 points) Is $v = \begin{bmatrix} -1 \\ 1 \\ -4 \end{bmatrix}$ in $\text{Col}(A)$?

yes, b/c $\bar{a}_3 + \bar{a}_4 = \bar{v}$