

Quiz 6, March 3, 2016

Which of the vectors

$$a = \begin{bmatrix} 1 \\ -1 \end{bmatrix}, \quad b = \begin{bmatrix} 2 \\ -3 \end{bmatrix}, \quad c = \begin{bmatrix} -2 \\ 2 \end{bmatrix}, \quad d = \begin{bmatrix} 1 \\ 0 \end{bmatrix}, \quad e = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

are in the null space of

$$A = \begin{bmatrix} 2 & 2 \\ 3 & 3 \end{bmatrix}?$$

Explain.

Answer: The vectors a , c , and e are in the null space of A . The vectors b and d are not in the null space of A . The reason is

$$Aa = \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \quad Ab = \begin{bmatrix} -2 \\ -3 \end{bmatrix} \neq \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \quad Ac = \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \quad Ad = \begin{bmatrix} 2 \\ 3 \end{bmatrix} \neq \begin{bmatrix} 0 \\ 0 \end{bmatrix}, \quad Ae = \begin{bmatrix} 0 \\ 0 \end{bmatrix}.$$