2018 Fall EECS205002 Linear Algebra

Name: ID:

2018/11/21 Quiz 5

1. For a 4×4 matrix

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

   - What is the rank of A?
   - Give a basis of A's column space that are formed by A's column vectors.

2. Let $\vec{v}_1 = (3, 2)^T$, $\vec{v}_2 = (4, 3)^T$, $\vec{u}_1 = (1, 1)^T$, and $\vec{u}_2 = (-1, 1)^T$. Find the transition matrix from $[\vec{v}_1, \vec{v}_2]$ to $[\vec{u}_1, \vec{u}_2]$.

3. For an $m \times n$ matrix A, what is the meaning that A has a right inverse? If A has a right inverse, can $n > m$? Justify your answer.