
Exercise 1 Let $A = \begin{bmatrix} | & | & | \\ \mathbf{c}_1 & \mathbf{c}_2 & \mathbf{c}_3 \\ | & | & | \end{bmatrix}$ be a 3×3 matrix with columns $\mathbf{c}_1$, $\mathbf{c}_2$ and $\mathbf{c}_3$.

Suppose $A \begin{bmatrix} -1 \\ -1 \\ 2 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$

Which of the following can we conclude from the given information? Select ALL that apply.

Select All Correct Answers:

1. $\mathbf{c}_2 + \mathbf{c}_3 = \begin{bmatrix} -1 \\ -1 \\ 2 \end{bmatrix}$

2. $-\mathbf{c}_1 - \mathbf{c}_2 + 2\mathbf{c}_3 = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$

3. A is non-singular.

4. $\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ is in $\text{span}(\mathbf{c}_1, \mathbf{c}_2, \mathbf{c}_3)$.

5. Vector $\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ can be written as a linear combination of the columns of A .