

Question 1 True/False: Any set that is a basis for a vector space V is also a linearly independent set.

Multiple Choice:

- (a) True ✓
- (b) False

Question 2 True/False: Any linearly independent set that is a subset of V is a basis for V .

Multiple Choice:

- (a) True
- (b) False ✓

Question 3 True/False: If the $\text{Span}\{\vec{b}_1, \dots, \vec{b}_p\}$ is equal to some vector space V , then $\{\vec{b}_1, \dots, \vec{b}_p\}$ is a basis for V .

Multiple Choice:

- (a) True
- (b) False ✓

Question 4 True/False: The pivot columns of A form a basis for $\text{Col } A$.

Multiple Choice:

- (a) True ✓
- (b) False

Question 5 True/False: Suppose the matrix A below is row equivalent to the matrices U_1 and U_2 below. Which of the following statements is true?

$$A = \begin{bmatrix} 2 & 6 & 4 & 7 \\ -2 & 3 & -4 & 2 \\ -6 & 0 & -12 & -8 \end{bmatrix} \quad U_1 = \begin{bmatrix} 2 & 0 & 4 & 3 \\ 0 & 3 & 0 & 2 \\ 0 & 0 & 0 & 1 \end{bmatrix} \quad U_2 = \begin{bmatrix} 1 & 0 & 2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

Multiple Choice:

- (a) $\left\{ \begin{bmatrix} 2 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 3 \\ 0 \end{bmatrix}, \begin{bmatrix} 3 \\ 2 \\ 1 \end{bmatrix} \right\}$ forms a basis for $\text{Col } A$.
- (b) $\left\{ \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \right\}$ forms a basis for $\text{Col } A$.
- (c) $\left\{ \begin{bmatrix} 2 \\ -2 \\ -6 \end{bmatrix}, \begin{bmatrix} 6 \\ 3 \\ 0 \end{bmatrix}, \begin{bmatrix} 7 \\ 2 \\ -8 \end{bmatrix} \right\}$ forms a basis for $\text{Col } A$. ✓