
Exercise 1 Suppose $\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3$ and $\mathbf{w}$ are vectors in $\mathbb{R}^n$. What are the implications of the statement: $\mathbf{w}$ is in the span of $\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3$. Select all that apply.

Select All Correct Answers:

1. Vector $\mathbf{w}$ a linear combination of $\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3$
2. The set $\{\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3, \mathbf{w}\}$ contains redundant vectors.
3. Vectors $\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3, \mathbf{w}$ are linearly independent.
4. Vectors $\mathbf{v}_1, \mathbf{v}_2, \mathbf{v}_3, \mathbf{w}$ are linearly dependent.
5. Vector $\mathbf{v}_1$ can be written as a linear combination of $\mathbf{v}_2, \mathbf{v}_3, \mathbf{w}$.
6. The equation $a\mathbf{v}_1 + b\mathbf{v}_2 + c\mathbf{v}_3 + d\mathbf{w} = \mathbf{0}$ has a non-trivial solution.