

SECTION ONE.III.2: LINEAR COMBINATION LEMMA

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Definition: A linear combination of vectors $\bar{u}_1, \bar{u}_2, \dots, \bar{u}_n$ is

Example: Write three distinct linear combination of the vectors $\bar{u}_1 = (1, 2, 3)$ and $\bar{u}_2 = (1, -1, 1)$.

Example: Is $\bar{v} = (2, -1, 2)$ a linear combination of $\bar{u}_1 = (1, 2, 3)$ and $\bar{u}_2 = (1, -1, 1)$?

Example: Do two steps of Gauss-Jordan reduction on the matrix below but record the steps as linear combinations of rows.

$$\begin{bmatrix} 1 & 2 & 1 \\ -1 & 2 & 0 \\ 3 & 0 & 8 \end{bmatrix}$$

True or False

If the matrix B is the reduced row echelon form of matrix A , then the rows of B are linear combinations of the rows of A .

In echelon form, no nonzero row can be a linear combination of any of the other nonzero rows.