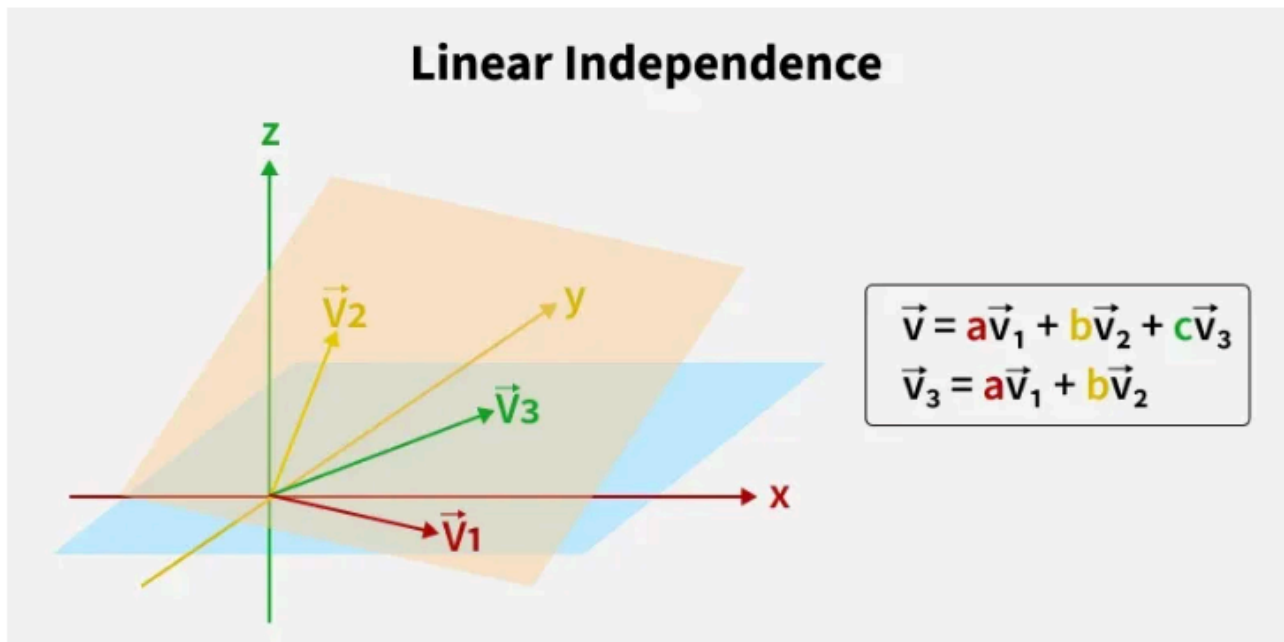


# Linear Independence

it is necessary for determining the size of a vector space and finding solutions for optimization problems.



In a vector space, a set of vectors is said to be linearly independent if no vector in the set can be expressed as a linear combination of the other vectors in the set.

For example, in a two-dimensional vector space, the vectors  $(1, 0)$  and  $(0, 1)$  are linearly independent because no scalar multiple of one can produce the other.

However, the vectors  $(1, 2)$  and  $(2, 4)$  are linearly dependent because the second vector is simply twice the first.