



Linear Combinations

1 Why

TODO

2 Definition

A *linear combination* is a sequence of vectors and a sequence of scalars from a vector space. The *result of a linear combination* is the result of scaling the i th vector by the i th scalar and adding the results.

A *trivial linear combination* is one whose sequence of scalars is zero at each coordinate. A *nontrivial linear combination* is one which is not trivial: in other words, there exists one coordinate of its scalar sequence which is nonzero.

2.1 Notation

Let (V, \mathbf{F}) be a vector space. Let $v = (v_1, \dots, v_n)$ be a sequence of vectors in V . Let $a = (a_1, \dots, a_n)$ be a sequence of scalars in \mathbf{F} . Then (v, a) is a linear combination and we can express its result by

$$a_1v_1 + a_2v_2 + \dots + a_nv_n.$$

3 Relationships

TODO span equivalence