

DEFINITION

If a vector space V has a basis consisting of n vectors, then the number n is called the **dimension** of V , written as $\dim V = n$.

If $V = \{\mathbf{0}\}$, we **define** $\dim V = 0$.



RESULT

Let H be a subspace of vector space V , where both are **finite - dimensional**. Then $\dim H \leq \dim V$.



EXAMPLE

Determine the dimension of the following subspaces of \mathbb{R}^3 :

$$(a) \quad W_1 = \{(d, c - d, c) \mid c, d \in \mathbb{R}\}$$

$$(b) \quad W_2 = \{(2b, 0, b) \mid b \in \mathbb{R}\}$$

