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#ref #disorganized #incomplete

## 1 | #definition dimension

The dimension of  $V$  (denoted  $\dim V$ ) is the length of a basis in  $V$  - This relies on Axler2.35: Basis length does not depend on the basis Any two bases of a finite-dimensional vector space have the same length

### 1.1 | Results

### 1.2 | Axler2.38 Dimension of a subspace

If  $V$  is finite-dimensional and  $U$  is a subspace of  $V$ , then  $\dim U \leq \dim V$  - Intuitive. The basis of a subspace is shorter than the basis of the original vecspace, because otherwise it's span would be larger than the original vecspace (because bases are linearly independent).

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