Why

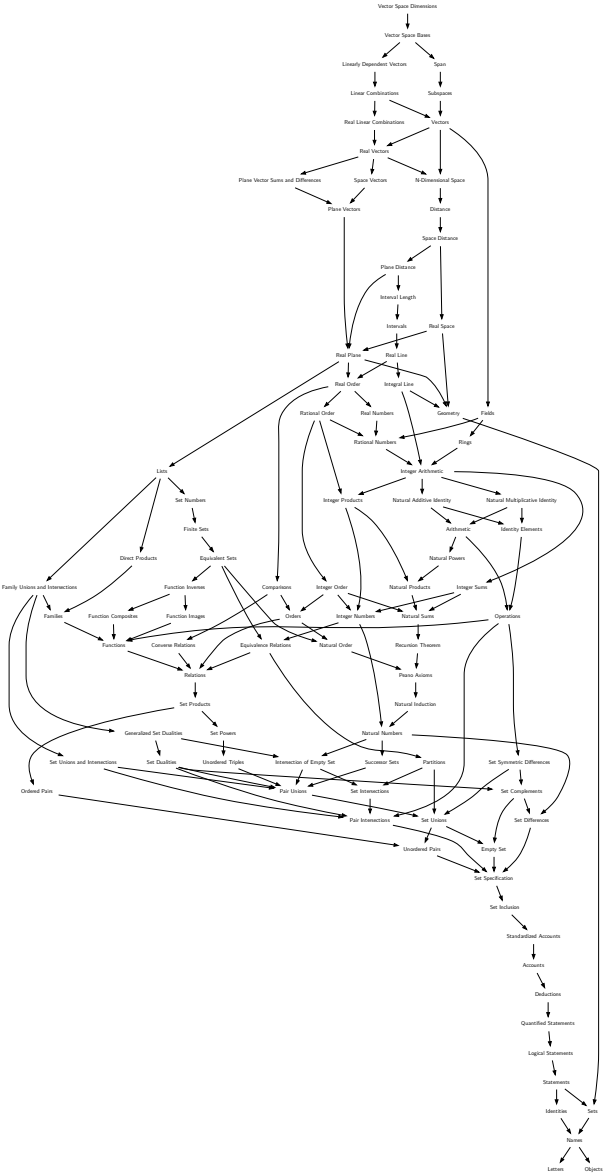
The number of vectors in any basis is the same.

Defining Result

A vector space is *finite-dimensional* if it has a finite basis; otherwise it is it is *infinite-dimensional*.

Prop. 1. *Every basis of a finitely spanned vector space has the same number of elements.*

The *dimension* of a finite-dimensional vector space is the number of distinct vectors in any basis. If a vector space is finite-dimensional and every basis has n distinct elements we call it a *n-dimensional vector space*.


Vector Space Dimensions
Vector Space Bases
Linearly Dependent Vectors
Span
Linear Combinations
Subspaces
Real Linear Combinations
Vectors
Real Vectors
Plane Vector Sums and Differences
Space Vectors
N-Dimensional Space
Plane Vectors
Distance
Space Distance
Plane Distance
Interval Length
Intervals
Real Space
Real Plane
Real Line
Real Order
Integral Line
Rational Order
Real Numbers
Geometry
Fields
Rational Numbers
Rings
Lists
Integer Arithmetic
Set Numbers
Integer Products
Natural Additive Identity
Natural Multiplicative Identity
Arithmetic
Identity Elements
Finite Sets
Natural Powers
Direct Products
Equivalent Sets
Family Unions and Intersections
Function Inverses
Comparison
Integer Order
Natural Products
Integer Sums
Families
Function Composites
Function Images
Orders
Integer Numbers
Natural Sums
Operations
Functions
Converse Relations
Equivalence Relations
Natural Order
Recursion Theorem
Relations
Peano Axioms
Set Products
Natural Induction
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Set Dualities
Unordered Triples
Intersection of Empty Set
Successor Sets
Partitions
Set Symmetric Differences
Ordered Pairs
Pair Unions
Set Intersections
Set Complements
Pair Intersections
Set Unions
Set Differences
Empty Set
Unordered Pairs
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects