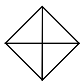


Why

Since every affine set is a translate of some (unique) subspace, it is natural to define the dimension of an affine set as the dimension of this subspace.

Definition

The *dimension* of a nonempty affine set is the dimension of the subspace parallel to it. By convention, $\varnothing$ has dimension -1. Naturally, the *points*, *lines* and *planes* are affine sets of dimension 0, 1, and 2 respectively.

If an affine set has dimension r, then we often call it an r-*flat*.

For any $S \subset \mathbf{R}^n$, we define the dimension of A to be the dimension of the affine hull of A.

Notation

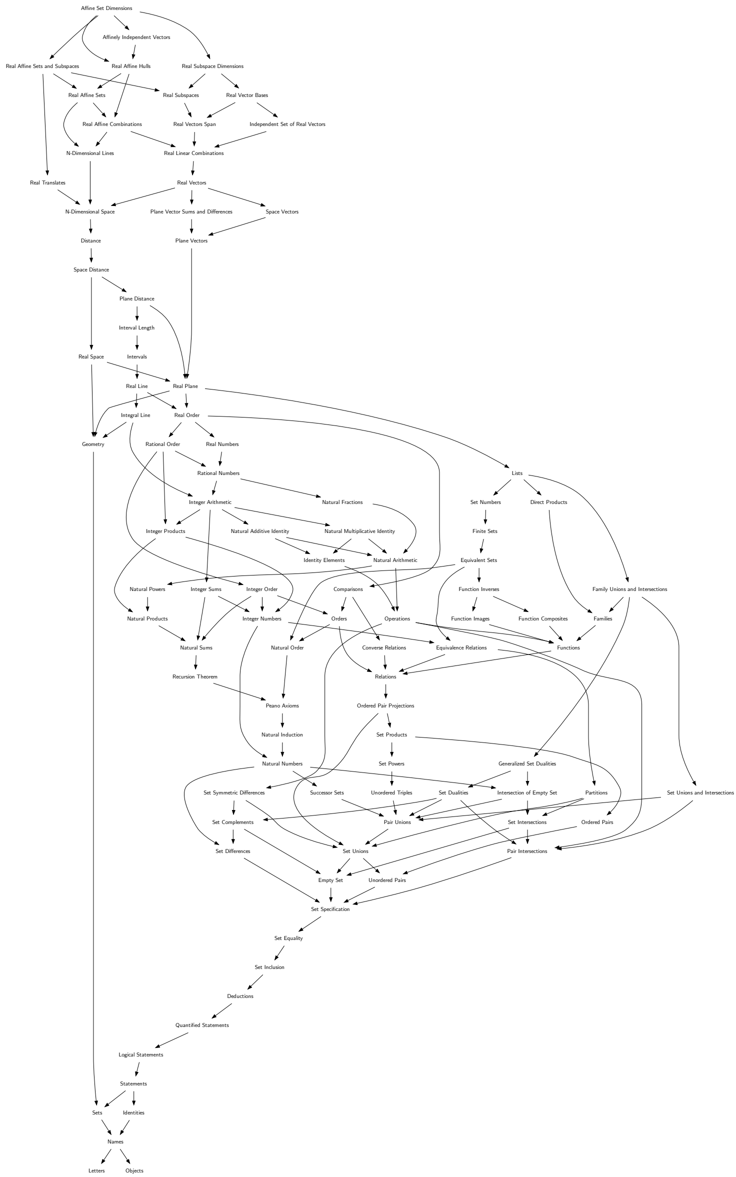
We denote the dimension of the set $S \subset \mathbf{R}^n$ by $\dim S$ We have defined it so that

$$\dim S = \dim \operatorname{aff} S$$

This makes sense if S is affine, since in this case $\operatorname{aff} S = S$.

Result

Proposition 1. *Any r-flat has $r+1$ affinely independent points. Each of its sets of size $r+2$ are affinely dependent.*


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