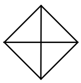


Why

Definition

The *line through* two points in n-dimensional space is the set of points which can be expressed as the sum of the first point and a scaled multiple of the difference between the second point and the first. An *affine set* is a subset of n-dimensional space which contains the lines through each of its points.

Examples

The empty set is trivially an affine set. The entire set of points in n-dimensional space is an affine set. Any singleton is an affine set.

Notation

The *line through* two points x and y in R^n is the set

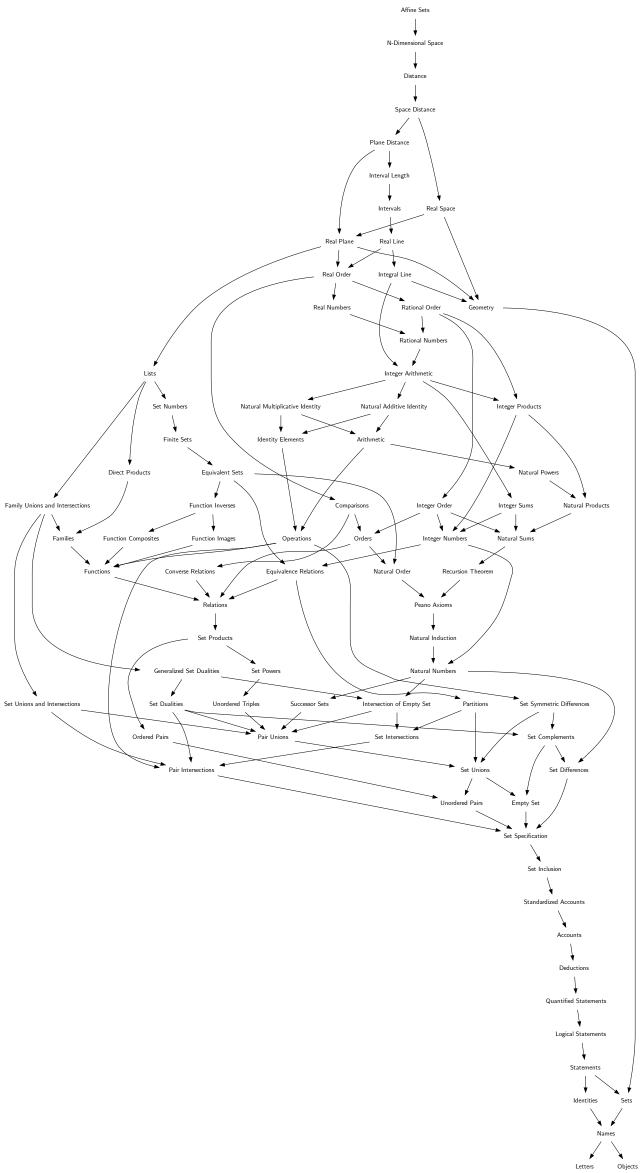
$$\{x + a(y - x) \mid a \in \mathsf{R} \text{ and } x, y \in \mathsf{R}^n\}.$$

Notice that the expression $x + a(y - x)$ is equivalent to $(1 - a)x + ay$.

Other Terminology

Some authors call affine sets *affine varieties*, *linear varieties* or *flat*.

Prop. 1. *The intersection of a family of affine sets is affine.*


Affine Sets
N-Dimensional Space
Distance
Space Distance
Plane Distance
Interval Length
Intervals
Real Space
Real Plane
Real Line
Real Order
Integral Line
Real Numbers
Rational Order
Geometry
Rational Numbers
Lists
Integer Arithmetic
Set Numbers
Natural Multiplicative Identity
Natural Additive Identity
Integer Products
Finite Sets
Identity Elements
Arithmetic
Direct Products
Equivalent Sets
Natural Powers
Family Unions and Intersections
Function Inverses
Comparisons
Integer Order
Integer Sums
Natural Products
Families
Function Composites
Function Images
Operations
Orders
Integer Numbers
Natural Sums
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
Successor Sets
Intersection of Empty Set
Partitions
Set Symmetric Differences
Ordered Pairs
Pair Unions
Set Intersections
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects