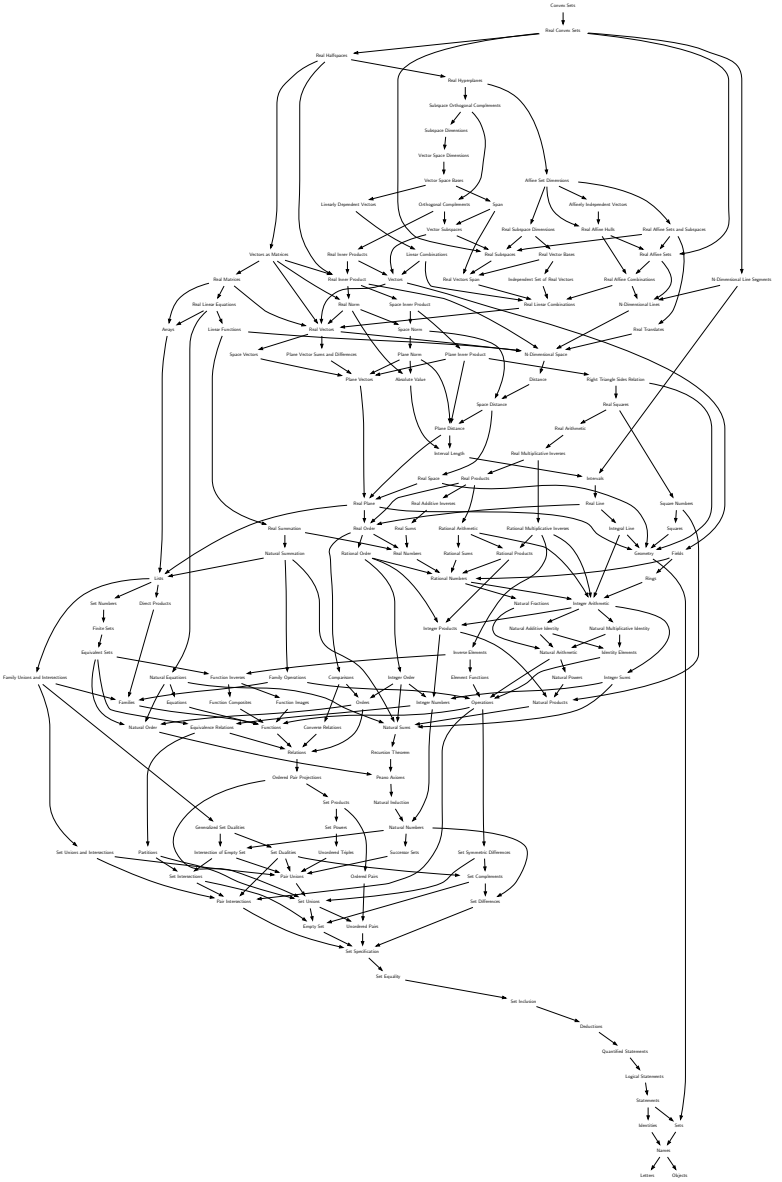
Why

We generalize convex sets to arbitrary vector spaces.

Definition

Suppose X is a vector space over $\mathbf{R}$. A set $C \subset X$ is *convex* if it contains the closed line segment between every pair of distinct points. In other words,

$$\lambda x + (1 - \lambda)y \in C \quad \text{for all } x, y \in C \text{ and } \lambda \in [0, 1].$$


Convex Sets
Real Convex Sets
Real Halfspaces
Real Hyperplanes
Subspace Orthogonal Complements
Subspace Dimension
Vector Space Dimension
Vector Space Bases
Affine Set Dimension
Linearly Dependent Vectors
Orthogonal Complements
Span
Affinely Independent Vectors
Vector Subspaces
Real Subspace Dimension
Real Affine Hulls
Real Affine Sets and Subspaces
Vectors as Matrices
Real Inner Products
Linear Combinations
Real Subspaces
Real Vector Bases
Real Affine Sets
Real Matrices
Real Inner Product
Vectors
Real Vector Spaces
Independent Set of Real Vectors
Real Affine Combinations
N-Dimensional Line Segments
Real Linear Equations
Real Norm
Space Inner Product
Real Linear Combination
N-Dimensional Lines
Arrays
Linear Functions
Real Vectors
Space Norm
Real Translates
Space Vectors
Plane Vector Sums and Differences
Plane Norm
Plane Inner Product
N-Dimensional Space
Plane Vectors
Absolute Value
Distance
Right Triangle Sides Relation
Space Distance
Real Squares
Plane Distance
Real Arithmetic
Interval Length
Real Multiplicative Inverses
Real Spans
Real Products
Intervals
Real Plane
Real Addition Inverses
Real Line
Square Numbers
Real Summation
Real Order
Real Sums
Rational Arithmetic
Rational Multiplicative Inverses
Integral Line
Squares
Natural Summation
Rational Order
Real Numbers
Rational Sums
Rational Products
Geometry
Fields
Rational Numbers
Rings
Lists
Natural Fractions
Integer Arithmetic
Set Numbers
Direct Products
Integer Products
Natural Addition Identity
Natural Multiplicative Identity
Finite Sets
Inverse Elements
Natural Arithmetic
Identity Elements
Equivalent Sets
Family Unions and Intersections
Natural Equations
Function Inverses
Family Operations
Comparisons
Integer Order
Element Functions
Natural Powers
Integer Sums
Families
Equations
Function Composites
Function Images
Orders
Integer Numbers
Operations
Natural Products
Natural Order
Equivalence Relations
Functions
Converse Relations
Natural Sums
Relations
Recursion Theorem
Ordered Pair Projections
Peano Axioms
Set Products
Natural Induction
Set Powers
Natural Numbers
Generalized Set Duplex
Set Unions and Intersections
Partitions
Intersection of Empty Set
Set Duplex
Unordered Tuples
Successor Sets
Set Symmetric Differences
Set Intersections
Pair Unions
Ordered Pairs
Set Complements
Pair Intersections
Set Unions
Set Differences
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deduction
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects