Why

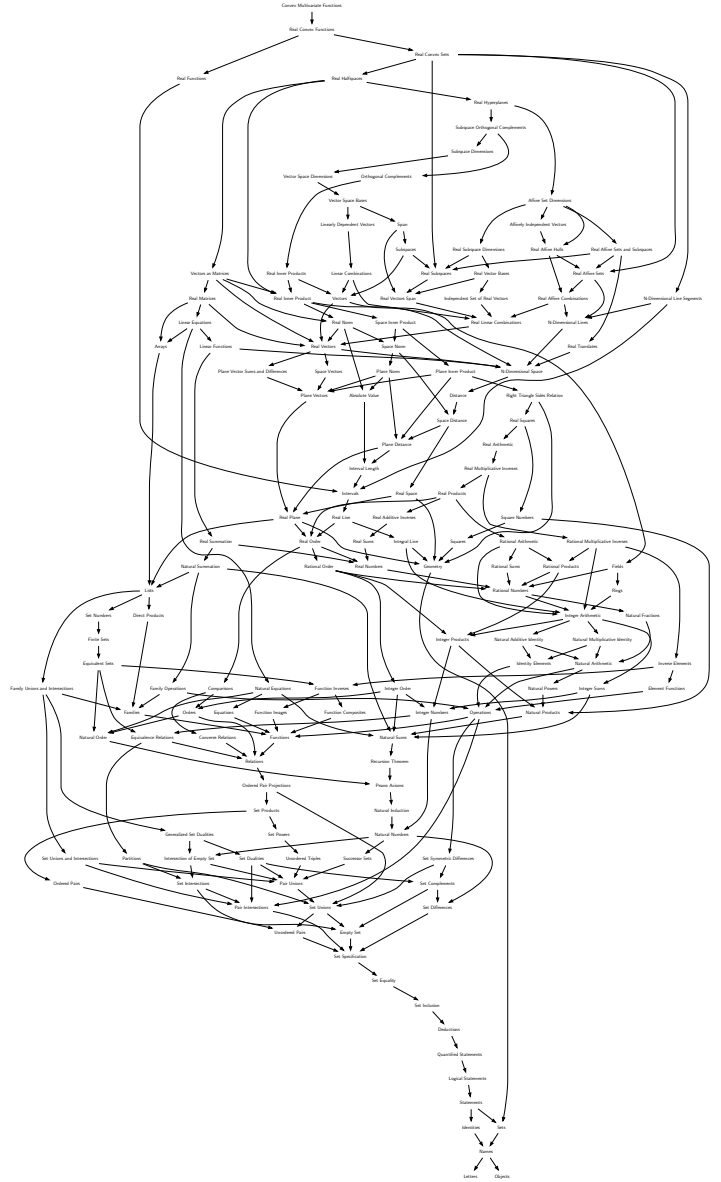
We generalize convex functions to $\mathbf{R}^n$.

Definition

Let A be a convex subset of $\mathbf{R}^n$. The function $f : A \to \mathbf{R}$ is *convex* if for any $a, b \in A$ and $t \in [0, 1]$,

$$f(ta + (1-t)b) \leq tf(a) + (1-t)f(b).$$

It is *concave* if $-f$ is convex.


Convex Multivariate Functions
Real Convex Functions
Real Convex Sets
Real Functions
Real Halfspaces
Real Hyperplanes
Subspace Orthogonal Complements
Subspace Dimension
Vector Space Dimension
Orthogonal Complements
Vector Space Bases
Affine Set Dimension
Linearly Dependent Vectors
Span
Affinely Independent Vectors
Subspaces
Real Subspace Dimensions
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 Span
Independent Set of Real Vectors
Real Affine Combinations
N-Dimensional Line Segments
Linear Equations
Real Norm
Space Inner Product
Real Linear Combinations
N-Dimensional Lines
Arrays
Linear Functions
Real Vectors
Space Norms
Real Translations
Plane Vector Sums and Differences
Space Vectors
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
Intervals
Real Space
Real Products
Real Order
Real Line
Real Additive Inverses
Square Numbers
Real Summation
Real Sums
Integral Line
Squares
Rational Arithmetic
Rational Multiplication Inverses
Natural Summation
Rational Order
Real Numbers
Geometry
Rational Sums
Rational Products
Fields
Rational Numbers
Rings
Lists
Integer Arithmetic
Natural Factorial
Set Numbers
Direct Products
Integer Products
Natural Addition Identity
Natural Multiplication Identity
Finite Sets
Identity Elements
Natural Arithmetic
Inverse Elements
Equivalent Sets
Family Unions and Intersections
Family Operations
Comparisons
Natural Equations
Function Inverses
Integer Order
Natural Powers
Integer Sums
Element Functions
Functions
Orders
Relations
Function Images
Function Composition
Integers
Natural Products
Natural Order
Equivalence Relations
Concrete Relations
Functions
Natural Sums
Relations
Recursion Theorems
Peano Axioms
Ordered Pair Projections
Natural Induction
Set Products
Set Powers
Natural Numbers
Generalized Set Dualities
Set Unions and Intersections
Partitions
Intersection of Empty Set
Set Dualities
Unordered Triples
Successor Sets
Set Symmetric Differences
Ordered Pairs
Set Intersections
Pair Unions
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects