Why

We speak of functions which always bends up.[1]

Definition

Suppose $X \subset \mathbf{R}$ is a convex set. A function $f : X \to \mathbf{R}$ is *convex* if

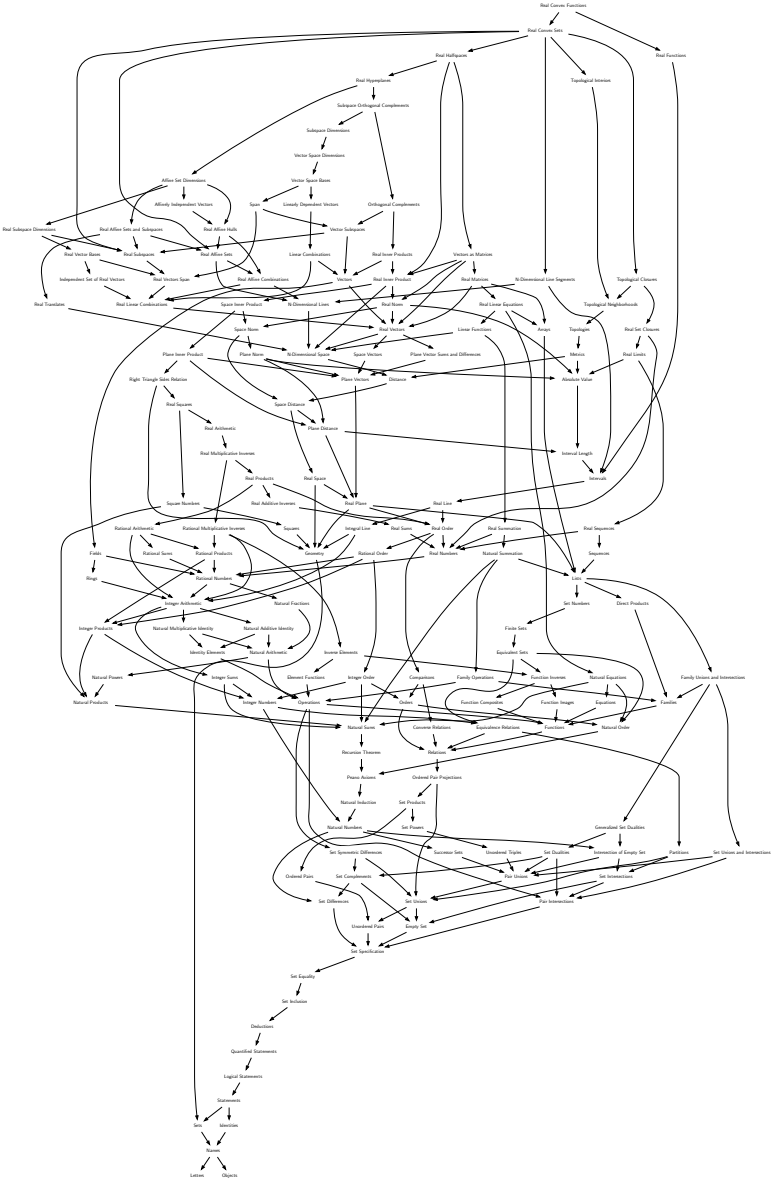
$$f(tx + (1-t)y) \leq tf(x) + (1-t)f(y)$$

for all $y \in [0,1]$ and $x, y \in X$.

In other words, a real-valued function is a function defined on a convex set of real numbers for which the result of the function on a convex combination of any two points in the domain is smaller than the convex combination of the same length of the value of the function on the endpoints.

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

[1] Future editions may expand.


Real Convex Functions
Real Convex Sets
Real Halfspaces
Real Functions
Real Hyperplanes
Topological Interiors
Subspace Orthogonal Complements
Subspace Dimensions
Vector Space Dimensions
Affine Set Dimensions
Vector Space Bases
Affinely Independent Vectors
Span
Linearly Dependent Vectors
Orthogonal Complements
Real Subspace Dimensions
Real Affine Sets and Subspaces
Real Affine Hulls
Vector Subspaces
Real Vector Bases
Real Subspaces
Real Affine Sets
Linear Combinations
Real Inner Products
Vectors as Matrices
Independent Set of Real Vectors
Real Vectors Span
Real Affine Combinations
Vectors
Real Inner Product
Real Matrices
N-Dimensional Line Segments
Topological Closures
Real Translates
Real Linear Combinations
Space Inner Product
N-Dimensional Lines
Real Norm
Real Linear Equations
Topological Neighborhoods
Space Norm
Real Vectors
Linear Functions
Arrays
Topologies
Real Set Closures
Plane Inner Product
Plane Norm
N-Dimensional Space
Space Vectors
Plane Vector Sums and Differences
Metrics
Real Limits
Right Triangle Sides Relation
Plane Vectors
Distance
Absolute Value
Real Squares
Space Distance
Real Arithmetic
Plane Distance
Real Multiplication Inverses
Interval Length
Intervals
Real Products
Real Space
Real Plane
Real Additive Inverses
Real Lists
Square Numbers
Rational Arithmetic
Rational Multiplication Inverses
Squares
Integral Line
Real Sums
Real Order
Real Summation
Real Sequences
Fields
Rational Sums
Rational Products
Geometry
Rational Order
Real Numbers
Natural Summation
Sequences
Rings
Rational Numbers
Lists
Integer Arithmetic
Natural Factors
Set Numbers
Direct Products
Integer Products
Natural Multiplication Identity
Natural Additive Identity
Finite Sets
Identity Elements
Natural Arithmetic
Inverse Elements
Equivalent Sets
Natural Powers
Integer Sums
Element Functions
Integer Order
Comparisons
Family Operations
Function Inverses
Natural Equations
Family Unions and Intersections
Natural Products
Integer Numbers
Operations
Orders
Function Composites
Function Images
Equations
Families
Natural Sums
Concrete Relations
Equivalence Relations
Functions
Natural Order
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
Ordered Pairs
Set Complements
Pair Unions
Set Intersections
Set Differences
Set Unions
Pair Intersections
Unordered Pairs
Empty Set
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Sets
Identities
Nouns
Lattices
Objects