Why

We want a condition for a unique minimizer.

Definition

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

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

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

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

Real Strictly Convex Functions

Real Convex Functions

Real Convex Sets

N-Dimensional Space   Real Functions

Distance

Space Distance

Plane Distance

Interval Length

Intervals   Real Space

Real Line   Real Plane

Real Order   Integral Line

Rational Order   Real Numbers   Geometry

Rational Numbers

Integer Arithmetic   Lists

Set Numbers   Direct Products

Integer Products   Natural Additive Identity   Natural Multiplicative Identity   Finite Sets

Arithmetic   Identity Elements   Equivalent Sets

Integer Order   Integer Sums   Natural Powers   Comparisons   Function Inverse   Family Unions and Intersections

Integer Numbers   Natural Products   Orders   Operations   Function Images   Function Composites   Families

Natural Sums   Equivalence Relations   Natural Order   Converse Relations   Functions

Recursion Theorem   Relations

Peano Axioms   Ordered Pair Projections

Natural Induction   Set Products

Generalized Set Dualities   Set Powers

Natural Numbers

Set Symmetric Differences   Partitions   Successor Sets   Intersection of Empty Set   Set Dualities   Unordered Triples   Set Unions and Intersections

Set Complements   Set Intersections   Pair Unions   Ordered Pairs

Set Differences   Set Unions   Pair Intersections

Empty Set   Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities   Sets

Names

Letters   Objects

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