Why

1

Result

Proposition 1. *A necessary condition for a maximizer of $x^T A x$ subject to $x \in \mathbf{R}^n$ and $x^T x = 1$ is that $Ax = \lambda x$ where λ is the Lagrange multiplier...*[2]

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[1]Future editions will expand. Discussion will likely include eigenvalues.

[2]Future editions will complete, and include references to lagrange multiplier, gradient, quadratic form, necessary conditions, etc.

Constrained Quadratic Form Extrema

Quadratic Forms

Matrix Trace — Real Vectors

Matrix-Matrix Products — Matrix Transpose

Matrix-Vector Products — Real Matrices — Identity Matrices

Linear Combinations — Matrices

Vectors

N-Dimensional Space

Distance

Space Distance

Plane Distance

Interval Length

Intervals

Real Space — Real Plane — Real Line

Sequences — Real Order — Integral Line

Direct Products — Fields — Real Numbers — Geometry

Groups — Rational Numbers — Set Numbers

Integer Additive Inverse — Integer Arithmetic — Finite Sets

Inverse Elements — Natural Multiplicative Identity — Natural Additive Identity — Integer Sums — Equivalent Sets

Element Functions — Identity Elements — Arithmetic

Family Unions and Intersections — Function Inverse — Algebras — Natural Power — Integer Products

Families — Function Composite — Function Images — Operations — Natural Products — Integer Numbers

Functions — Natural Sums — Equivalence Relations

Relations — Recursion Theorem — Natural Order

Peano Axioms

Cartesian 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

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