

1. Record Nr.	UNINA9911020172103321
Autore	Kaplan Wilfred <1915->
Titolo	Maxima and minima with applications : practical optimization and duality // Wilfred Kaplan
Pubbl/distr/stampa	New York, : Wiley, c1999
ISBN	9786613306210 9781283306218 1283306212 9781118032794 1118032799 9781118031049 1118031040
Descrizione fisica	1 online resource (298 p.)
Collana	Wiley-Interscience series in discrete mathematics and optimization
Disciplina	511/.66
Soggetti	Maxima and minima Mathematical optimization
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"A Wiley-Interscience publication."
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Maxima and Minima with Applications: Practical Optimization and Duality; Contents; Preface; 1 Maxima and Minima in Analytic Geometry; 1.1 Maxima and Minima; Case of Functions of One Variable; Problems 1.1-1.5; 1.2 Convexity; 1.3 Convexity and Maxima and Minima; Problems 1.6-1.16; 1.4 Problems in Two Dimensions; Problems 1.17-1.27; 1.5 Some Geometric Extremum Problems; Problems 1.28-1.36; 1.6 Geometry of n-Dimensional Space; 1.7 Convex Functions of n Variables; 1.8 Quadratic Forms; Problems 1.37-1.55; 1.9 Convexity and Extrema, Level Sets and Sublevel Sets; Problems 1.56-1.63; 1.10 Stability 1.11 Global Asymptotic Stability, Application to Finding MinimizerProblems 1.64-1.73; 1.12 Extrema of Functions on Unbounded Closed Sets; 1.13 Shortest Distance from a Linear Variety; Problems 1.74-1.84; 1.14 Other Inner Products and Norms in R^n ; 1.15 More on Minimum Problems for Quadratic Functions; Problems 1.85- 1.93; 1.16 Physical Applications; Problems 1.94-1.96; 1.17 Best

Approximation by Polynomials; Problems 1.97-1.105; References; 2 Side Conditions; 2.1 Review of Vector Calculus; Problems 2.1-2.13; 2.2 Local Maxima and Minima, Side Conditions; Problems 2.14-2.21 2.3 Second-Derivative Test Problems 2.22-2.26; 2.4 Gradient Method for Finding Critical Points; Problems 2.27-2.28; 2.5 Applications; Problems 2.29-2.33; 2.6 Karush-Kuhn-Tucker Conditions; Problems 2.34-2.37; 2.7 Sufficient Conditions for the Mathematical Programming Problem; 2.8 Proof of the Karush-Kuhn-Tucker Conditions; Problems 2.38-2.49; References; 3 Optimization; 3.1 Convexity; Problems 3.1-3.17; 3.2 Mathematical Programming, Duality; 3.3 Unconstrained Quadratic Optimization; Problems 3.18-3.28; 3.4 Constrained Quadratic Optimization in R^n 3.5 QP with Inequality Constraints, QP Algorithm Problems 3.29-3.38; 3.6 Linear Programming; 3.7 Simplex Algorithm; Problems 3.39-3.55; 3.8 LP with Bounded Variables; Problems 3.56-3.62; 3.9 Convex Functions and Convex Programming; Problems 3.63-3.68; 3.10 The Fermat-Weber Problem and a Dual Problem; Problems 3.69-3.76; 3.11 A Duality Relation in Higher Dimensions; Problems 3.77-3.84; References; 4 Fenchel-Rockafellar Duality Theory; 4.1 Generalized Directional Derivative; Problems 4.1-4.5; 4.2 Local Structure of the Boundary of a Convex Set; Problems 4.6-4.8 4.3 Supporting Hyperplane, Separating Hyperplane Problems 4.9-4.15; 4.4 New Definition of Convex Function, Epigraph, Hypograph; Problems 4.16-4.17; 4.5 Conjugate of Convex and Concave Functions; Problems 4.18-4.24; 4.6 Fenchel Duality Theorem; Problems 4.25-4.32; 4.7 Rockafellar Duality Theorem; 4.8 Proof of Lemma C; Problems 4.33-4.45; 4.9 Norms, Dual Norms, Minkowski Norms; Problems 4.46-4.61; 4.10 Generalized Fermat-Weber Problem; 4.11 Application to Facility Location; Problems 4.62-4.74; References; Appendix: Linear Algebra; Answers to Selected Problems; Index

Sommario/riassunto

This new work by Wilfred Kaplan, the distinguished author of influential mathematics and engineering texts, is destined to become a classic. Timely, concise, and content-driven, it provides an intermediate-level treatment of maxima, minima, and optimization. Assuming only a background in calculus and some linear algebra, Professor Kaplan presents topics in order of difficulty. In four short chapters, he describes basic concepts and geometric aspects of maxima and minima, progresses to problems with side conditions, introduces optimization and programming, and concludes with an in-depth discuss
