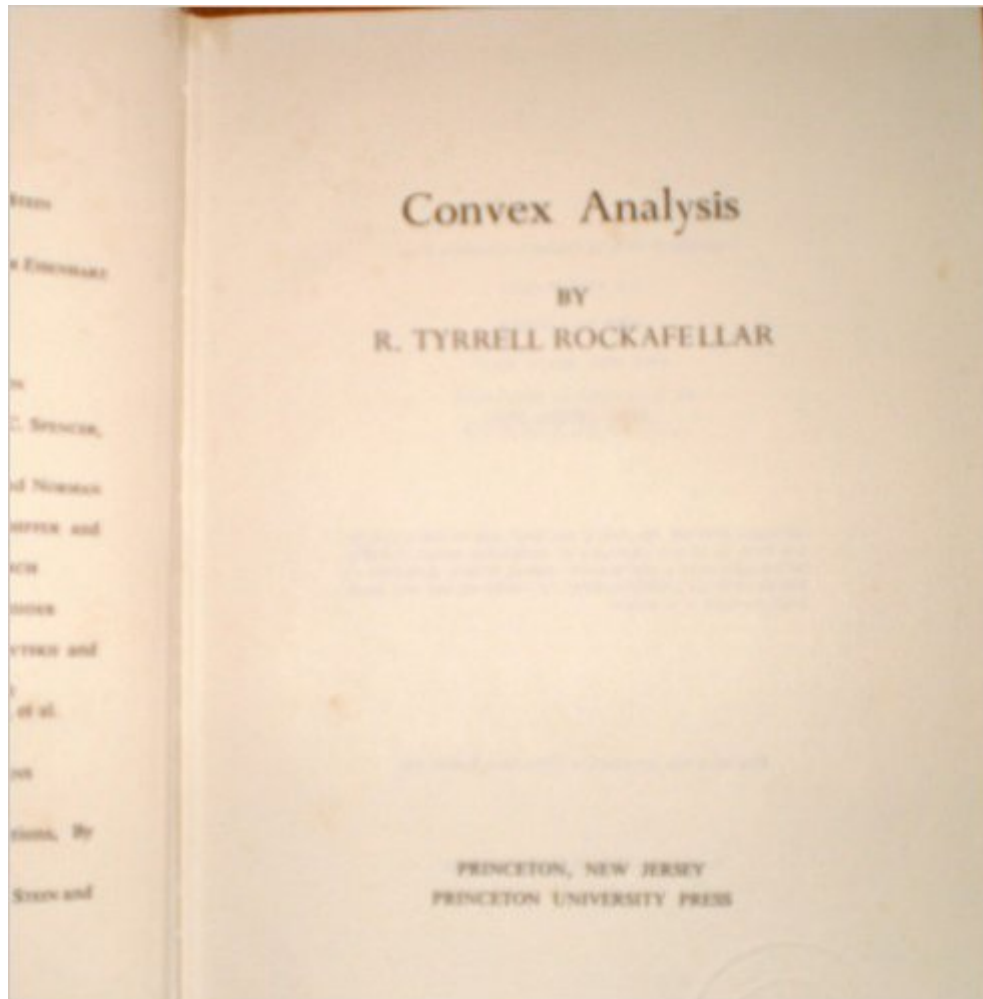# Convex Analysis (Princeton Landmarks In Mathematics And Physics)

Synopsis

Available for the first time in paperback, R. Tyrrell Rockafellar's classic study presents readers with a coherent branch of nonlinear mathematical analysis that is especially suited to the study of optimization problems. Rockafellar's theory differs from classical analysis in that differentiability assumptions are replaced by convexity assumptions. The topics treated in this volume include: systems of inequalities, the minimum or maximum of a convex function over a convex set, Lagrange multipliers, minimax theorems and duality, as well as basic results about the structure of convex sets and the continuity and differentiability of convex functions and saddle- functions. This book has firmly established a new and vital area not only for pure mathematics but also for applications to economics and engineering. A sound knowledge of linear algebra and introductory real analysis should provide readers with sufficient background for this book. There is also a guide for the reader who may be using the book as an introduction, indicating which parts are essential and which may be skipped on a first reading.

Book Information

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Customer Reviews

In a nutshell, an exceptional book, ideal for use as a reference (completeness and organization stands out), but also excellent for self-studying too! In fact, the last part came as a pleasant surprise to me.PhD Candidates conducting theoretical research could definitely learn a great deal about writing elegant and good math from this book.You just need to understand thata) you would rather have previous exposition to abstract mathematics (otherwise I doubt it is fit for you),b) The first few

sections quickly introduce you to convex analysis, but the book is huge and it is extremely ambitious to try to read it from cover to cover.c) The book is about convex ANALYSIS, NOT CONVEX GEOMETRY. It (intentionally) does not focus on the geometric interpretation of convexity and for a good reason. Many convex settings involve multiple dimensions (e.g. thousands for convex optimization problems). A geometric account is more intuitive but does not safely and readily extend to multiple dimensions, where intuition is lost or becomes error prone. That is where analysis shines, as it abstracts the geometric intuition into algebraic relations and properties. So don't expect to find fancy figures and illustrations (it has none).d) The book contains theoretical results pertaining to convex optimization, and is certainly written, in large, with that in mind. But remember, it is about the theory, NOT ABOUT THE ALGORITHMS etc. You need it to gain profound knowledge on the theoretical aspects of convexity. If you need to focus on convex optimization see e.g. the book from Stephen Boyd on Convex Optimization (also available for free on his website).

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