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Mathematics : Convex and Discrete Geometry

Hug, Daniel, Weil, Wolfgang

Lectures on Convex Geometry

- The text provides a self-contained and efficient one-semester introduction to the main concepts and results in convex geometry.
- The selected topics highlight the interactions between geometry and analysis, treating several topics for the first time in an introductory textbook.
- Suggestions for further reading and a large number of solved exercises complement the main text

This book provides a self-contained introduction to convex geometry in Euclidean space. After covering the basic concepts and results, it develops Brunn–Minkowski theory, with an exposition of mixed volumes, the Brunn–Minkowski inequality, and some of its consequences, including the isoperimetric inequality. Further central topics are then treated, such as surface area measures, projection functions, zonoids, and geometric valuations. Finally, an introduction to integral-geometric formulas in Euclidean space is provided. The numerous exercises and the supplementary material at the end of each section form an essential part of the book. Convexity is an elementary and natural concept. It plays a key role in many mathematical fields, including functional analysis, optimization, probability theory, and stochastic geometry. Paving the way to the more advanced and specialized literature, the material will be accessible to students in the third year and can be covered in one semester.

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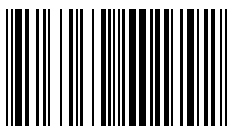
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