

Measure and Integration

This textbook provides readers with a solid foundation of essential knowledge required for broad areas of mathematics, particularly real analysis, functional analysis, probability theory, and mathematical statistics. Key topics include product measures, Fourier transformation, the change-of-variables formula, concepts of convergence, absolute continuity, and measures on topological spaces. Highlights include the derivation of the Riesz representation theorem using an extension result by Kisynski, and the proof of the existence and uniqueness of the Haar measure. The book also contains a section on the convergence of measures and Prokhorov's theorem. The text is enriched with numerous excursions into the history of mathematics and short portraits of mathematicians who made significant contributions to the book's subject matter. A wide range of exercises deepens the understanding of the material. This book is a translation of the original German 8th edition. The translation was done with the help of an artificial intelligence machine translation tool. A subsequent human revision was done primarily in terms of content, so that the book may read stylistically differently from a conventional translation.

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