

Measure Theory

Bearbeitet von
Vladimir I Bogachev

1. Auflage 2006. Buch. xvii, 1075 S. Hardcover

ISBN 978 3 540 34513 8

Format (B x L): 15,5 x 23,5 cm

Gewicht: 1982 g

[Weitere Fachgebiete > Mathematik > Mathematische Analysis](#)

Zu [Leseprobe](#)

schnell und portofrei erhältlich bei


DIE FACHBUCHHANDLUNG

Die Online-Fachbuchhandlung beck-shop.de ist spezialisiert auf Fachbücher, insbesondere Recht, Steuern und Wirtschaft. Im Sortiment finden Sie alle Medien (Bücher, Zeitschriften, CDs, eBooks, etc.) aller Verlage. Ergänzt wird das Programm durch Services wie Neuerscheinungsdienst oder Zusammenstellungen von Büchern zu Sonderpreisen. Der Shop führt mehr als 8 Millionen Produkte.

Contents

Preface	v
Chapter 1. Constructions and extensions of measures	1
1.1. Measurement of length: introductory remarks	1
1.2. Algebras and σ -algebras	3
1.3. Additivity and countable additivity of measures	9
1.4. Compact classes and countable additivity	13
1.5. Outer measure and the Lebesgue extension of measures	16
1.6. Infinite and σ -finite measures	24
1.7. Lebesgue measure	26
1.8. Lebesgue-Stieltjes measures	32
1.9. Monotone and σ -additive classes of sets	33
1.10. Souslin sets and the A -operation	35
1.11. Caratheodory outer measures	41
1.12. Supplements and exercises	48
Set operations (48). Compact classes (50). Metric Boolean algebra (53). Measurable envelope, measurable kernel and inner measure (56). Extensions of measures (58). Some interesting sets (61). Additive, but not countably additive measures (67). Abstract inner measures (70). Measures on lattices of sets (75). Set-theoretic problems in measure theory (77). Invariant extensions of Lebesgue measure (80). Whitney's decomposition (82). Exercises (83).	
Chapter 2. The Lebesgue integral	105
2.1. Measurable functions	105
2.2. Convergence in measure and almost everywhere	110
2.3. The integral for simple functions	115
2.4. The general definition of the Lebesgue integral	118
2.5. Basic properties of the integral	121
2.6. Integration with respect to infinite measures	124
2.7. The completeness of the space L^1	128
2.8. Convergence theorems	130
2.9. Criteria of integrability	136
2.10. Connections with the Riemann integral	138
2.11. The Hölder and Minkowski inequalities	139

2.12.	Supplements and exercises	143
	The σ -algebra generated by a class of functions (143). Borel mappings on $\mathbb{R}^n$ (145). The functional monotone class theorem (146). Baire classes of functions (148). Mean value theorems (150). The Lebesgue–Stieltjes integral (152). Integral inequalities (153). Exercises (156).	
Chapter 3.	Operations on measures and functions	175
3.1.	Decomposition of signed measures	175
3.2.	The Radon–Nikodym theorem	177
3.3.	Products of measure spaces	180
3.4.	Fubini’s theorem	183
3.5.	Infinite products of measures	187
3.6.	Images of measures under mappings	190
3.7.	Change of variables in $\mathbb{R}^n$	194
3.8.	The Fourier transform	197
3.9.	Convolution	204
3.10.	Supplements and exercises	209
	On Fubini’s theorem and products of σ -algebras (209). Steiner’s symmetrization (212). Hausdorff measures (215). Decompositions of set functions (218). Properties of positive definite functions (220). The Brunn–Minkowski inequality and its generalizations (222). Mixed volumes (226). Exercises (228).	
Chapter 4.	The spaces L^p and spaces of measures	249
4.1.	The spaces L^p	249
4.2.	Approximations in L^p	251
4.3.	The Hilbert space L^2	254
4.4.	Duality of the spaces L^p	262
4.5.	Uniform integrability	266
4.6.	Convergence of measures	273
4.7.	Supplements and exercises	277
	The spaces L^p and the space of measures as structures (277). The weak topology in L^p (280). Uniform convexity (283). Uniform integrability and weak compactness in L^1 (285). The topology of setwise convergence of measures (291). Norm compactness and approximations in L^p (294). Certain conditions of convergence in L^p (298). Hellinger’s integral and Hellinger’s distance (299). Additive set functions (302). Exercises (303).	
Chapter 5.	Connections between the integral and derivative ..	329
5.1.	Differentiability of functions on the real line	329
5.2.	Functions of bounded variation	332
5.3.	Absolutely continuous functions	337
5.4.	The Newton–Leibniz formula	341
5.5.	Covering theorems	345
5.6.	The maximal function	349
5.7.	The Henstock–Kurzweil integral	353

5.8.	Supplements and exercises	361
	Covering theorems (361). Density points and Lebesgue points (366). Differentiation of measures on $\mathbb{R}^n$ (367). The approximate continuity (369). Derivates and the approximate differentiability (370). The class BMO (373). Weighted inequalities (374). Measures with the doubling property (375). Sobolev derivatives (376). The area and coarea formulas and change of variables (379). Surface measures (383). The Calderón–Zygmund decomposition (385). Exercises (386).	
	Bibliographical and Historical Comments	409
	References	441
	Author Index	483
	Subject Index	491