

Contents

Preface	ix
Chapter 1. Early Triumphs	1
1.1. The Basel Problem	1
1.2. The Fundamental Theorem of Algebra	3
Chapter 2. Approximation	5
2.1. Completeness of Weighted Powers	5
2.2. The Müntz Approximation Theorem	7
Chapter 3. Operator Theory	13
3.1. The Fuglede-Putnam Theorem	13
3.2. Toeplitz Operators	14
3.3. A Theorem of Beurling	22
3.4. Prediction Theory	28
3.5. The Riesz-Thorin Convexity Theorem	34
3.6. The Hilbert Transform	40
Chapter 4. Harmonic Analysis	45
4.1. Fourier Uniqueness via Complex Variables (d'après D.J. Newman)	45
4.2. A Curious Functional Equation	46
4.3. Uniqueness and Nonuniqueness for the Radon Transform	49
4.4. The Paley-Wiener Theorem	54
4.5. The Titchmarsh Convolution Theorem	57
4.6. Hardy's Theorem	58
Chapter 5. Banach Algebras: The Gleason-Kahane-Żelazko Theorem	63
Chapter 6. Complex Dynamics: The Fatou-Julia-Baker Theorem	67
Chapter 7. The Prime Number Theorem	71
Coda: Transonic Airfoils and SLE	77
Appendix A. Liouville's Theorem in Banach Spaces	81
Appendix B. The Borel-Carathéodory Inequality	83
Appendix C. Phragmén-Lindelöf Theorems	85
Appendix D. Normal Families	87