

Contents

Foreword	vii
Introduction	ix
Nomenclature	xiii
1 Real interpolation	1
1.1 The K -method	1
1.1.1 Examples	7
1.1.2 Exercises	18
1.2 The trace method	20
1.2.1 Exercises	26
1.3 Dual spaces of real interpolation spaces	28
1.4 Intermediate spaces and reiteration	30
1.4.1 Examples	37
1.4.2 Applications: the theorems of Marcinkiewicz and Stampacchia; regularity in elliptic PDE's . .	39
1.4.3 Exercises	42
2 Complex interpolation	45
2.1 Definitions and properties	47
2.1.1 Examples	55
2.1.2 The theorems of Hausdorff-Young and Stein . .	58
2.1.3 Exercises	61
3 Interpolation and domains of operators	63
3.1 Operators with rays of minimal growth	63
3.1.1 Exercises	69
3.2 Two or more operators	70
3.2.1 Exercises	75

3.2.2	The sum of two commuting operators	75
3.2.3	Exercises	83
4	Powers of positive operators	85
4.1	Definitions and general properties	85
4.1.1	Exercises	94
4.1.2	Powers of nonnegative operators	95
4.1.3	Exercises	98
4.2	Operators with bounded imaginary powers	98
4.2.1	The sum of two commuting operators with bounded imaginary powers	105
4.2.2	Maximal L^p regularity for equations in UMD spaces	110
4.2.3	Exercises	114
4.3	M-accretive operators in Hilbert spaces	115
4.3.1	Self-adjoint operators in Hilbert spaces	122
5	Interpolation and semigroups	129
5.1	Real interpolation between Banach spaces and domains of generators	135
5.1.1	Exercises	140
5.2	Examples and applications	141
5.3	Regularity in elliptic PDE's by interpolation	148
5.4	Regularity in evolution equations by interpolation	156
6	Analytic semigroups and interpolation	161
6.1	Characterization of real interpolation spaces	162
6.1.1	Exercises	165
6.2	Generation of analytic semigroups by interpolation . . .	165
6.3	Regularity in abstract parabolic equations	167
6.3.1	Exercises	176
6.4	An application: space – time Hölder regularity in parabolic PDE's	177
A	The Bochner integral	181
A.1	Integrals over measurable real sets	181
A.2	L^p and Sobolev spaces	183
A.3	Weighted L^p spaces	185
References		187
Index		195