

CONTENTS

CHAPTER 1. THE ONE-DIMENSIONAL MAXIMUM PRINCIPLE	1
1. The maximum principle, 1.	2. The generalized maximum principle,
8.	3. The initial value problem, 10.
12.	4. Boundary value problems,
5. Approximation in boundary value problems, 14.	6. Approximation in the initial value problem, 24.
37.	7. The eigenvalue problem,
8. Oscillation and comparison theorems, 42.	9. Nonlinear operators,
47.	49. Bibliographical notes,
CHAPTER 2. ELLIPTIC EQUATIONS	51
1. The Laplace operator, 51.	2. Second-order elliptic operators.
Transformations, 56.	3. The maximum principle of E. Hopf, 61.
4. Uniqueness theorems for boundary value problems, 68.	5. The generalized maximum principle, 72.
6. Approximation in boundary value problems, 76.	7. Green's identities and Green's function, 81.
8. Eigenvalues, 89.	9. The Phragmèn-Lindelöf principle, 93.
10. The Harnack inequalities, 106.	11. Capacity, 122.
12. The Hadamard three-circles theorem, 128.	13. Derivatives of harmonic functions, 137.
14. Boundary estimates for the derivatives, 141.	15. Applications of bounds for derivatives, 145.
16. Nonlinear operators, 149.	Bibliographical notes, 156.
CHAPTER 3. PARABOLIC EQUATIONS	159
1. The heat equation, 159.	2. The one-dimensional parabolic operator,
163.	3. The general parabolic operator, 173.
4. Uniqueness theorems for boundary value problems, 175.	5. A three-curves theorem, 178.
6. The Phragmèn-Lindelöf principle, 182.	7. Nonlinear operators, 186.
8. Weakly coupled parabolic systems, 188.	Bibliographical notes, 193.
CHAPTER 4. HYPERBOLIC EQUATIONS	195
1. The wave equation, 195.	2. The wave operator with lower order terms, 197.
3. The two-dimensional hyperbolic operator, 200.	

- 4.** Bounds and uniqueness in the initial value problem, 208. **5.** Riemann's function, 210. **6.** Initial-boundary value problems, 213. **7.** Estimates for series solutions, 215. **8.** The two-characteristic problem, 218. **9.** The Goursat problem, 231. **10.** Comparison theorems, 232. **11.** The wave equation in higher dimensions, 234. **Bibliographical notes**, 239.

BIBLIOGRAPHY

240

INDEX

257

