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Second Derivatives; Introduction; 4.1 C^1 , estimates for continuous; 4.2 Regularized distance; 4.3 Existence of solutions for continuous; 4.4 Holder gradient estimates for the Dirichlet problem; 4.5 C^1 , estimates with discontinuous in two dimensions; 4.6 C^1 , estimates for discontinuous in higher dimensions; 4.7 C^2 , estimates; Notes; Exercises; 5. Weak Solutions; Introduction; 5.1 Definitions and basic properties of weak derivatives; 5.2 Sobolev imbedding theorems; 5.3 Poincaré's inequality; 5.4 The weak maximum principle; 5.5 Trace theorems; 5.6 Existence of weak solutions; 5.7 Higher regularity of solutions; 5.8 Global boundedness of weak solutions; 5.9 The local maximum principle; 5.10 The DeGiorgi class; 5.11 Membership of supersolutions in the De Giorgi class; 5.12 Consequences of the local estimates; 5.13 Integral characterizations of Holder spaces; 5.14 Schauder estimates; Notes; Exercises; 6. Strong Solutions; Introduction; 6.1 Pointwise estimates for strong solutions; 6.2 A sharp trace theorem; 6.3 Results from harmonic analysis; 6.4 Some further estimates for boundary value problems in a spherical cap; 6.5 L_p estimates for solutions of constant coefficient problems in a spherical cap; 6.6 Local estimates for strong solutions of constant coefficient problems; 6.7 Local interior L_p estimates for the second derivatives of strong solutions of differential equations; 6.8 Local L_p second derivative estimates near the boundary; 6.9 Existence of strong solutions for the oblique derivative problem

Sommario/riassunto

This book gives an up-to-date exposition on the theory of oblique derivative problems for elliptic equations. The modern analysis of shock reflection was made possible by the theory of oblique derivative problems developed by the author. Such problems also arise in many other physical situations such as the shape of a capillary surface and problems of optimal transportation. The author begins the book with basic results for linear oblique derivative problems and work through the theory for quasilinear and nonlinear problems. The final chapter discusses some of the applications. In addition, no