

Grisvard, P.**Elliptic problems in nonsmooth domains.** (English) [Zbl 0695.35060](#)[Monographs and Studies in Mathematics](#), 24. Pitman Advanced Publishing Program. Boston-London-Melbourne: Pitman Publishing Inc. XIV, 410 p. (1985).

Summary: We focus our attention on elliptic boundary value problems in domains with nonsmooth boundaries and problems with mixed boundary conditions. So far this topic has been mainly ignored. Indeed most of the available mathematical theories about elliptic boundary value problems deal with domains with very smooth boundaries; few of them deal with mixed boundary conditions. However, the majority of the elliptic boundary value problems which arise in practice are naturally posed in domains whose geometry is simple but not smooth. These domains are very often three-dimensional polyhedra. For the purpose of solving them numerically these problems are usually reduced to two-dimensional domains. Thus the domains are plane polygons and the boundary conditions are mixed. Accordingly this book is primarily intended for mathematicians working in the field of elliptic partial differential equations as well as for numerical analysts and users of such elliptic equations.

Chapter headings are as follows: Chapter 1: Sobolev spaces; Chapter 2: Regular second-order elliptic boundary value problems; Chapter 3: Second-order elliptic boundary value problems in convex domains; Chapter 4: Second-order elliptic boundary value problems in polygons; Chapter 5: More singular solutions; Chapter 6: Results in spaces of Hölder functions; Chapter 7: A model fourth-order problem; Chapter 8: Miscellaneous; Bibliography; Index.

MSC:

- [35J25](#) Boundary value problems for second-order elliptic equations
- [35R05](#) PDEs with low regular coefficients and/or low regular data
- [35-02](#) Research exposition (monographs, survey articles) pertaining to partial differential equations
- [35B65](#) Smoothness and regularity of solutions to PDEs
- [65N99](#) Numerical methods for partial differential equations, boundary value problems

Cited in **10** Reviews
Cited in **2404** Documents

Keywords:[nonsmooth boundaries](#); [mixed boundary conditions](#); [polyhedra](#)