

<<奇异积分和函数的可微性>>

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内容概要

本书内容简介：This book is an outgrowth of a course which I gave at Orsay during the academic year 1966-67. My purpose in those lectures was to pre-sent some of the required background and at the same time clarify the essential unity that exists between several related areas of analysis. These areas are : the existence and boundedness of singular integral operators ; the boundary behavior of harmonic functions ; and differentiability properties of functions of several variables. As such the common core of these topics may be said to represent one of the central developments in n -dimensional Fourier analysis during the last twenty years , and it can be expected to have equal influence in the future. These pos.

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章节摘录

The basic ideas of the theory of real variables are connected with the concepts of sets and functions, together with the processes of integration and differentiation applied to them. While the essential aspects of these ideas were brought to light in the early part of our century, some of their further applications were developed only more recently. It is from this latter perspective that we shall approach that part of the theory that interests us. In doing so, we distinguish several main features: The theorem of Lebesgue about the differentiation of the integral. The study of properties related to this process is best done in terms of a "maximal function" to which it gives rise: the basic features of the latter are expressed in terms of a "weak-type" inequality which is characteristic of this situation. Certain covering lemmas. In general the idea is to cover an arbitrary open set in terms of a disjoint union of cubes or balls, chosen in a manner depending on the problem at hand. One such example is a lemma of Whitney (Theorem 3). Sometimes, however, it suffices to cover only a portion of the set, as in the simple covering lemma, which is used to prove the weak-type inequality mentioned above. Behavior near a "general" point of an arbitrary set. The simplest notion here is that of point of density. More refined properties are best expressed in terms of certain integrals first studied systematically by Marcinkiewicz. (4) The splitting of functions into their large and small parts. This feature which is more of a technique than an end in itself, recurs often. It is especially useful in proving inequalities, as in the first theorem of this chapter. That part of the proof of the first theorem is systematized in the Marcinkiewicz interpolation theorem discussed in § 4 of this chapter and also in Appendix B.

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