

<<概型的几何>>

图书基本信息

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内容概要

概型理论是代数几何的基础，在代数几何的经典领域不变理论和曲线模中有了较好的发展。将代数数论和代数几何有机的结合起来，实现了早期数论学者们的愿望。这种结合使得数论中的一些主要猜测得以证明。

本书旨在建立起经典代数几何基本教程和概型理论之间的桥梁。

例子讲解详实，努力挖掘定义背后的深层次东西。

练习加深读者对内容的理解。

学习本书的起点低，了解交换代数和代数变量的基本知识即可。

本书揭示了概型和其他几何观点，如流形理论的联系。

了解这些观点对学习本书是相当有益的，虽然不是必要。

目次：基本定义；例子；射影概型；经典结构；局部结构；概型和函子。

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1.4 The Functor of Points One of the intriguing things about schemes is precisely that they have so much structure that is not conveyed by their underlying sets, so that the familiar operations on sets such as taking direct products require vigilant scrutiny lest they turn out not to make sense. It is therefore remarkable that many of the set-theoretic ideas can be restored through a simple device, the functor of points. This point of view, while initially adding a layer of complication to the subject, is often extremely illuminating; as a result it and its attendant terminology have become pervasive. We will give a brief introduction to the necessary definitions here and use them occasionally in the following chapters before returning to them in detail in Chapter VI. We start with the observation that the points of a scheme do not in general look anything like one another: we have non-closed points as well as closed ones; and if we are working over a non-algebraically closed field, then even closed points may be distinguished by having different residue fields. Similarly, if we are working over \mathbb{Z} , different points may have residue fields of different characteristic; and if we extend the notion of point to "closed subscheme whose underlying topological space is a point," we have an even greater variety. And, of course, a morphism between schemes will not at all be determined by the associated map on underlying point sets. There is, however, a way of looking at a scheme—via its functor of points—that reduces it in effect to a set. More precisely, we may think of a scheme as an organized collection of sets, a functor on the category of schemes, on which the familiar operations on sets behave as usual. In this section we will examine this functorial description. A big payoff is that we will see the category of schemes embedded in a larger category of functors, in which many constructions are much easier. The advantage of this is something like the advantage in analysis of working with distributions, not just ordinary functions; it shifts the problem of making constructions in the category of schemes to the problem of understanding which functors come from schemes. Further, many geometric constructions that arise in the category of schemes can be extended to larger categories of functors in a useful way.

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