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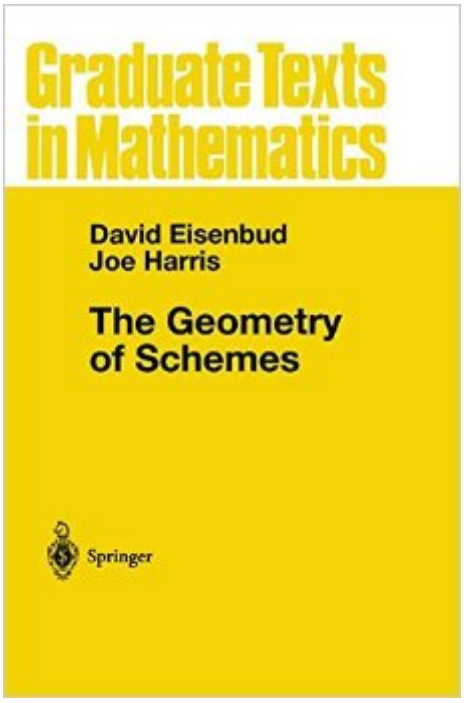
The Geometry Of Schemes (Graduate Texts In Mathematics)



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Synopsis

Grothendieckâ ™s beautiful theory of schemes permeates modern algebraic geometry and underlies its applications to number theory, physics, and applied mathematics. This simple account of that theory emphasizes and explains the universal geometric concepts behind the definitions. In the book, concepts are illustrated with fundamental examples, and explicit calculations show how the constructions of scheme theory are carried out in practice.

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Customer Reviews

The theory of schemes is usually thought to be highly abstract and esoteric, and one that makes the study of algebraic geometry even more difficult. The authors definitely dispel this notion in this book, which could have been called "A Concrete Introduction to Schemes", because of the clarity with which the concepts are introduced and explained. After studying this book, one will understand and appreciate the power of schemes in algebraic geometry. The authors do an even better job than they did in their earlier and short work "Schemes: The Language of Modern Algebraic Geometry", which is now out of print. In chapter 1, the main definitions are given and the basic concepts behind schemes outlined. That schemes are more complicated than varieties is readily apparent even in this beginning chapter, where they are thought of as corresponding to the spectrum of a commutative ring with identity. Very elementary exercises are given to help the reader gain confidence in the constructions involved. They authors do have to discuss some sheaf theory, but they show its relevance nicely in this chapter. They also discuss the notion of a fibered product as a

generalization of the idea of a preimage of a set under the application of a function and relate it to the construction of the functor of points. The role of the functor of points as reducing schemes to a kind of set theory is brought out beautifully here. The next chapter gives many examples of schemes, with the first examples being reduced schemes over algebraically closed fields, these being essentially the ordinary varieties of classical algebraic geometry. The authors then give examples of schemes, the local schemes, which are more general than varieties.

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