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B. Sethuraman

Rings, Fields, and Vector Spaces

An Introduction to Abstract Algebra via Geometric Constructibility

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This book is an attempt to communicate to undergraduate mathematics majors my enjoyment of abstract algebra. It grew out of a course offered at California State University, Northridge, in our teacher preparation program, titled Foundations of Algebra, that was intended to provide an advanced perspective on high-school mathematics. When I first prepared to teach this course, I needed to select a set of topics to cover. The material that I selected would clearly have to have some bearing on school-level mathematics, but at the same time would have to be substantial enough for a university-level course. It would have to be something that would give the students a perspective into abstract mathematics, a feel for the conceptual elegance and grand simplifications brought about by the study of structure. It would have to be of a kind that would enable the students to develop their creative powers and their reasoning abilities. And of course, it would all have to fit into a sixteen-week semester. The choice to me was clear: we should study constructibility. The mathematics that leads to the proof of the nontrisectibility of an arbitrary angle is beautiful, it is accessible, and it is worthwhile. Every teacher of mathematics would profit from knowing it. Now that I had decided on the topic, I had to decide on how to develop it. All the students in my course had taken an earlier course . .



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