<<线性代数>>

图书基本信息

书名：<<线性代数>>

13位ISBN编号：9787506292191

10位ISBN编号：750629219X

出版时间：2008-5

出版时间：世界图书出版公司

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页数：251

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前言

You are probably about to teach a course that will give students their second exposure to linear algebra. During their first brush with the subject, your students probably worked with Euclidean spaces and matrices. In contrast, this course will emphasize abstract vector spaces and linear maps.The audacious title of this book deserves an explanation. Almost all linear algebra books use determinants to prove that every linear operator on a finite-dimensional complex vector space has an eigenvalue.Determinants are difficult, nonintuitive, and often defined without motivation. To prove the theorem about existence of eigenvalues on complex vector spaces, most books must define determinants, prove that a linear map is not invertible if and only ff its determinant equals O, and then define the characteristic polynomial. This tortuous （torturous？） path gives students little feeling for why eigenvalues must exist.In contrast, the simple determinant-free proofs presented here offer more insight. Once determinants have been banished to the end of the book, a new route opens to the main goal of linear algebra-understanding the structure of linear operators.This book starts at the beginning of the subject, with no prerequi-sites other than the usual demand for suitable mathematical maturity.Even if your students have already seen some of the material in the first few chapters, they may be unaccustomed to working exercises of the type presented here, most of which require an understanding of proofs.Vector spaces are defined in Chapter 1, and their basic propertiesare developed.

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内容概要

The audacious title of this book deserves an explanation. Almost all linear algebra books use determinants to prove that every linear operator on a finite-dimensional complex vector space has an eigenvalue. Determinants are difficult, nonintuitive, and often defined without motivation. To prove the theorem about existence of eigenvalues on complex vector spaces, most books must.define determinants, prove that a linear map is not invertible ff and only if its determinant equals O, and then define the characteristic polynomial. This tortuous (torturous?) path gives students little feeling for why eigenvalues must exist. In contrast, the simple determinant-free proofs presented here offer more insight. Once determinants have been banished to the end of the book, a new route opens to the main goal of linear algebra-- understanding the structure of linear operators.

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书籍目录

章节摘录

插图：

编辑推荐

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