<<高等微积分>>

图书基本信息

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内容概要

本书是本科生的微积分教学用书，主要内容为：牛顿运动学基本定律（开篇），向量代数，天体力学简介，线性变换，微分形式和微分演算，隐函数反函数定理，重积分演算，曲线曲面积分，微积分基本定理，经典场论基本定理，爱因斯坦狭义相对论简介。
本书特别注意数学与物理、力学等自然科学的内在联系和应用。
作者在理念导引、内容选择、程度深浅、适用范围等方面都有相当周密的考虑。
从我们国内重点大学的教学角度看，本书的难易程度与物理、力学和电类专业数学课的微积分相当，而思想内容则要深刻和生动些，因此适于用作这些专业本科生的教科书或学习参考书。

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章节摘录

1.1 Prelude to Newton's Principia Popular mathematical history attributes to Isaac Newton (1642-1727) andGottfried Wilhelm Leibniz (1646-1716) the distinction of having invented calculus. Of course, it is not nearly so simple as that. Techniques for evaluating areas and volumes as limits of computable quantities go back to theGreeks of the classical era. The rules for differentiating polynomials and theuses of these derivatives were current before Newton or Leibniz were born.Even the fundamental theorem of calculus, relating integral and differentialcalculus, was known to Isaac Barrow (1630-1677), Newton's teacher. Yetit is not inappropriate to date calculus from these two men for they werethe first to grasp the power and universal applicability of the fundamentaltheorem of calculus. They were the first to see an inchoate collection ofresults as the body of a single unified theory.

Newton's preeminent application of calculus is his account of celestialmechanics in Philosophive Naturalis Principia Mathematica or Mathematical Principles of Natural Philosophy. Ironically, he makes very little specificmention of calculus in it. This may, in part, be due to the fact that calculuswas still sufficiently new that he felt it would be suspect. In part, it is areflection of an earlier age in which mathematicians jealously guarded powerful new techniques and only revealed the fruits of their labors. ……

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