

<<常微分方程基础理论 (影印版) >>

图书基本信息

书名：<<常微分方程基础理论 (影印版) >>

13位ISBN编号：9787040220667

10位ISBN编号：7040220660

出版时间：2007-7

出版时间：高等教育出版社

作者：赫斯赫

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

前言

为了更好地借鉴国外数学教育与研究的成功经验,促进我国数学教育与研究事业的发展,提高高等学校数学教育教学质量,本着“为我国热爱数学的青年创造一个较好的学习数学的环境”这一宗旨,天元基金赞助出版“天元基金影印数学丛书”。

该丛书主要包含国外反映近代数学发展的纯数学与应用数学方面的优秀书籍,天元基金邀请国内各个方向的知名数学家参与选题的工作,经专家遴选、推荐,由高等教育出版社影印出版。

为了提高我国数学研究生教学的水平,暂把选书的目标确定在研究生教材上。

当然,有的书也可作为高年级本科生教材或参考书,有的书则介于研究生教材与专著之间。

欢迎各方专家、读者对本丛书的选题、印刷、销售等工作提出批评和建议。

<<常微分方程基础理论 (影印版) >>

内容概要

本书为开展常微分方程研究工作的读者提供必要的准备知识,可作为本科高年级和研究生常微分方程课程教材。

本书内容分为四部分:第一部分(第一、二、三章)的内容包括解的存在性、唯一性、对数据的光滑依赖性,以及解的非唯一性;第二部分(第四、六、七章)讨论线性常微分方程,书中用矩阵的S-N分解代替Jordan分解,前者的计算较后者更容易;第三部分(第八、九、十章)讨论非线性常微分方程的稳定性、渐近稳定性等几何理论;第四部分(第五、十一、十二、十三章)讨论常微分方程的幂级数解,包括线性常微分方程的奇点分类及非线性常微分方程当参数或自变量趋向某奇点时的渐近解等。

<<常微分方程基础理论 (影印版) >>

书籍目录

Preface

Chapter .Fundamental Theorems of Ordinary Differential Equations

 -1.Existence and uniqueness with the Lipschitz condition

 -2.Existence without the Lipschitz condition

 -3.Some global properties of solutions

 -4.Analytic differential equations

Exercises

Chapter .Dependence on Data

 -1.Continuity with respect to initial data and parameters

 -2.Differentiability

Exercises

Chapter .Nonuniqueness

 -1.Examples

 -2.The Kneser theorem

 -3.Solution curves on the boundary of $R(A)$

 -4.Maximal and minimal solutions

 -5.A comparison theorem

 -6.Sufficient conditions for uniqueness

Exercises

Chapter .General Theory of Linear Systems

 -1.Some basic results concerning matrices

 -2.Homogeneous systems of linear differential equations

 -3.Homogeneous systems with constant coefficients

 -4.Systems with periodic coefficients

 -5.Linear Hamiltonian systems with periodic coefficients

 -6.Nonhomogeneous equations

 -7.Higher-order scalar equations

Exercises

Chapter .Singularities of the First Kind

 -1.Formal solutions of an algebraic differential equation

 -2.Convergence of formal solutions of a system of the first kind

 -3.The S-N decomposition of a matrix of infinite order

 -4.The S-N decomposition of a differential operator

 -5.A normal form of a differential operator

 -6.Calculation of the normal form of a differential operator

 -7.Classification of singularities of homogeneous linear systems

Exercises

Chapter .Boundary-Value Problems of Linear Differential Equations of the Second-Order

 -1.Zeros of solutions

 -2.Sturm-Liouville problems

 -3.Eigenvalue problems

 -4.Eigenfunction expansions

 -5.Jost solutions

 -6.Scattering data

 -7.Reflectionless potentials

 -8.Construction of a potential for given data

 -9.Differential equations satisfied by reflectionless potentials

 -10.Periodic potentials

Exercises

Chapter .Asymptotic Behavior of Solutions of Linear Systems

 -1.Liapounoff's type numbers

 -2.Liapounoff's type numbers of a homogeneous linear system

 -3.Calculation of Liapounoff's type numbers of solutions

 -4.A diagonalization theorem

 -5.Systems with asymptotically constant coefficients

 -6.An application of the Floquet theorem

Exercises

Chapter .Stability

 -1.Basic definitions

 -2.A sufficient condition for asymptotic stability

 -3.Stable manifolds

 -4.Analytic structure of stable manifolds

 -5.Two-dimensional linear systems with constant coefficients

 -6.Analytic systems in R^2

 -7.Perturbations of an improper node and a saddle point

 -8.Perturbations of a proper node

 -9.Perturbation of a spiral point

 -10.Perturbation of a center

Exercises

Chapter .Autonomous Systems

 -1.Limit-invariant sets

 -2.Liapounoff's direct method

 -3.Orbital stability

 -4.The Poincare-Bendixson theorem

 -5.Indices of Jordan curves

Exercises

Chapter .The Second-Order Differential Equation $(d^2x)/(dt^2)+h(x)*(dx)/(dt)+g(x)=0$

 -1.Two-point boundary-value problems

 -2.Applications of the Liapounoff functions

 -3.Existence and uniqueness of periodic orbits

 -4.Multipliers of the periodic orbit of the van der Pol equation

 -5.The van der Pol equation for a small ϵ

 -6.The van der Pol equation for a large parameter

 -7.A theorem due to M.Nagumo

 -8.A singular perturbation problem

Exercises

Chapter .Asymptotic Expansions

 -1.Asymptotic expansions in the sense of Poincare

 -2.Gevrey asymptotics

 -3.Flat functions in the Gevrey asymptotics

 -4.Basic properties of Gevrey asymptotic expansions

 -5.Proof of Lemma 2-6

Exercises

Chapter .Asymptotic Expansions in a Parameter

 -1.An existence theorem

 -2.Basic estimates

 -3.Proof of Theorem 1-2

 -4.A block-diagonalization theorem

 -5.Gevrey asymptotic solutions in a parameter

 -6.Analytic simplification in a parameter

Exercises

Chapter .Singularities of the Second Kind

 -1.An existence theorem

 -2.Basic estimates

 -3.Proof of Theorem 1-2

 -4.A block-diagonalization theorem

 -5.Cyclic vectors (A lemma of P.Deligne)

 -6.The Hukuhara-Turrittin theorem

 -7.An n-th-order linear differential equation at a singular point of the second kind

 -8.Gevrey property of asymptotic solutions at an irregular singular point

Exercises

References

Index

章节摘录

插图：

<<常微分方程基础理论（影印版）>>

编辑推荐

《常微分方程基础理论(影印版)》的引进是为了更好地借鉴国外微积分教学与研究的成功经验，促进我国数学教育与研究事业的发展，提高高等学校数学教育教学质量，为本科高年级和研究生开展常微分程研究工作提供必要的理论依据，《常微分方程基础理论(影印版)》为原版影印，既可供本科高年级和研究生自学参考，也可做为教材使用。

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>