<<Nonlinear differenti>>

图书基本信息

书名: <<Nonlinear differential equations and dynamical systems非线性微分方程和动态系统>>

13位ISBN编号: 9783540609346

10位ISBN编号: 3540609342

出版时间:2006-3

出版时间:广东教育出版社

作者: Verhulst, Ferdinand

页数:303

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

<<Nonlinear differenti>>

内容概要

"A good book for a nice price!" (Monatshefte f ü r Mathematik) "... for lecture courses that cover the classical theory of nonlinear differential equations associated with Poincar é and Lyapunov and introduce the student to the ideas of bifurcation theory and chaos this is an ideal text ..." (Mathematika) "The pedagogical style is excellent, consisting typically of an insightful overview followed by theorems, illustrative examples and exercises." (Choice)

<<Nonlinear differenti>>

书籍目录

1 Introduction 1.1 Definitions and notation 1.2 Existence and uniqueness 1.3 Gronwall's inequality2 Autonomous equations 2.1 Phase-space, orbits 2.2 Critical points and linearisation 2.3 Periodic solutions 2.4 First integrals and integral manifolds 2.5 Evolution of a volume element, Liouville's theorem 2.6 Exercises 3 Critical points 3.1 Two-dimensional linear systems 3.2 Remarks on three-dimensional linear systems 3.3 Critical points of nonlinear equations 3.4 Exercises 4 Periodic solutions 4.1 Bendixson's criterion 4.2 Geometric auxiliaries, preparation for the Poincare-Bendixson theorem 4.3 The Poincare-Bendixson theorem 4.4 Applications of the Poincar6-Bendixson theorem 4.5 Periodic solutions inRn 4.6 Exercises 5 Introduction to the theory of stability 5.1 Simple examples 5.2 Stability of equilibrium solutions 5.3 Stability of periodic solutions 5.4 Linearisation 5.5 Exercises 6 Linear Equations 6.1 Equations with constant coefficients 6.2 Equations with coefficients which have a limit 6.3 Equations with periodic coefficients 6.4 Exercises Stability by linearisation 7.1 Asymptotic stability of the trivial solution 7.2 Instability of the trivial solution 7.3 Stability of periodic solutions of autonomous equations Exercises 8 Stability analysis by the direct method 8.1 Introduction 8.2 Lyapunov functions 8.3 Hamiltonian systems and systems with first integrals 8.4 Applications and examples 8.5 Exercises9 Introduction to perturbation theory 9.1 Background and elementary examples 9.2 Basic material 9.3 Naive expansion 9.4 The Poincare expansion theorem 9.5 Exercises 10 The Poincare-Lindstedt method Periodic solutions of autonomous second-order equations 10.2 Approximation of periodic solutions on arbitrary long time-scales 10.3 Periodic solutions of equations with forcing terms 10.4 The existence of periodic solutions 10.5 Exercises11 The method of averaging 11.1 Introduction 11.2 The Lagrange standard form 11.3 Averaging in the periodic case 11.4 Averaging in the general case 11.5 Adiabatic invariants 11.6 Averaging over one angle, resonance manifolds 11.7 Averaging over more than one angle, an introduction Periodic solutions 11.9 Exercises 12 Relaxation Oscillations 13 Bifurcation Theory 14 Chaos 15 Hamiltonian systems Appendix 1 The Morse lemma Appendix 2 Linear periodic equations with a small parameter Appendix 3 Trigonometric formulas and averages Appendix 4 A sketch of Cotton's proof of the stable and unstable manifold theorem Appendix 5 Bifurcations of self-excited oscillations Appendix 6 Normal forms of Hamiltonian systems near equilibria Answers and hints to the exercises References Index

<<Nonlinear differenti>>

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