## **MA 36600**

## **Ordinary Differential Equations**

- §1.1 Basic Mathematical Models; Direction fields
- §1.2 Solutions of Some Differential Equations
- §1.3 Classification of Differential Equations
- §2.1 First Order Linear Equations
- §2.2 Separable Equations
- §2.3 Modeling With First Order Equations
- §2.4 Difference Between Linear and Nonlinear Equations
- §2.5 Autonomous Equations
- §2.6 Exact Equations
- §2.7 Numerical Approximations; Euler (Tangent Line) Method
- §3.1 Homogeneous Equations with Constant Coefficients
- §3.2 Solutions of Linear Homogeneous Equations; the Wronskian
- §3.3 Complex Roots of the Characteristic Equation
- §3.4 Repeated Roots of the Characteristic Equation; Reduction of Order
- §3.5 Nonhomgeneous Equations; Undetermined Coefficients
- §3.6 Variation of Parameters
- §3.7 Mechanical & Electrical Vibrations
- §3.8 Forced Vibrations
- $\S4.1 n^{\text{th}}$  Order Equations
- §4.2 Homogeneous Equations with Constant Coefficients
- §4.3 Undetermined Coefficients
- §7.1 Introduction to Systems of Differential Equations
- §7.3 Eigenvalues and Eigenvectors
- §7.4 Theory of First Order Linear Systems
- §7.5 Homogeneous Linear Systems with Constant Coefficients
- §7.6 Complex Eigenvalues
- §7.7 Fundamental Matrices
- §7.8 Repeated Eigenvalues
- §7.9 Nonhomogeneous Linear Systems
- §8.1 Euler (Tangent Line) Method
- §8.5 Approximations to Systems of First Order Equations
- §9.1 The Phase Plane
- §9.2 Autonomous Systems and Stability
- §9.3 Locally Linear Systems
- §9.4 Competing Species
- §9.5 Predator-Prey Equations