

Calculus 2, Chapter 9 Study Guide

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The following is a *brief* list of topics covered in Chapter 9 of *Thomas' Calculus*. Test questions will be chosen directly from the text. This list is not meant to be comprehensive, but only gives a list of several important topics. I reserve the right to ask you definitions and theorems on the tests. If I do so, then I will choose from the **bold-faced** items below.

9.1. Solutions, Slope Fields and Euler's Method. **first-order differential equation and solution**, initial condition, slope field, Euler's method, concerns over computational accuracy.

9.2. First-Order Linear Equations. **First-order differential equation**, solving first-order differential equations, electrical circuit differential equation.

9.3. Applications. Force of resistance of a moving object is proportional to the velocity, logistic growth model, orthogonal trajectories, mixture problems.

9.4. Graphical Solutions of Autonomous Differential Equations. **Autonomous ordinary differential equation**, equilibrium values (or "rest points"), phase line, graphing solutions, stability of equilibrium values, logistic equation.

9.5. Systems of Equations and Phase Planes. **Autonomous system of first order equations and solution**, trajectory, phase plane, competitive-hunter model, equilibria, Lotka-Volterra predator-prey model.