Concepts to understand for Test 1  
Math 210, Spring 2010

Solutions of Differential Equations:
• checking whether a function solves a differential equation
• solving linear differential equations using the Extended Linearity Principle

Modeling:
• translate an English description into a differential equation.
• population models (exponential model and logistic models)
• harvesting
• mixing problems

Analytic Techniques:
- Separation of variables.

Numerical methods:
• Euler method

Qualitative Methods (Geometric):
• slope field and solution curves through various initial conditions
• equilibrium solutions; sink, source, node
• phase line
• interconnection of all these concepts

Bifurcations:
• draw bifurcation diagram; find bifurcation values.

Existence and Uniqueness