Summer 2007 Math 331: Week 1

Section 1.1 Modeling via Differential Equations

- Population models: Unlimited Growth, Logistic Model, Modified Logistic Model (p. 89)
- Radioactive Decay

Section 1.1, Exercises 3 - 6, 10, 11, 12, 14, 15, 16 (2nd ed.: 1 - 4, 8, 9, 10, 12, 13, 14)

Section 1.2 Separation of Variables

Key concepts:

- Initial condition, Initial value problems
- Recognize separable differential equations
- Learn the method for solving separable equations
- Be aware of the difficulties: missing solutions, algebra errors

Important Models:

- Financial Models
- Mixing Models
- Newton's law of cooling

Section 1.2, Exercises 1, 2, 5 - 19, 21, 23 - 33, 35, 39 (2nd ed.: 1, 2, 5 - 19, 21, 25 - 35, 37, 41)

Section 1.8 Linear Equations

Key concepts:

- Recognize linear differential equations
- The linearity principle for the homogeneous case and the extended linearity principle for the nonhomogeneous case.
- Solving linear differential equations (the "lucky guess").

Important Models:

- Financial Models

Section 1.8, Exercises 1 - 12, 20, 29, 30, 31.