Math 30, Winter 2005

Topics for Exam 2:

Types of second order differential equations: You should be able to identify the various types of second order differential equations.

Solutions to second order linear homogeneous differential equations: You should know and be able to use all theorems about the form of solutions to these types of equations.

Solutions to constant coefficient second order differential equations: You should be able to find the characteristic equations, general solutions and particular solutions for these types of equations. You should know Euler's formula.

Harmonic oscillators: You should be able to set up differential equations to model simple and damped harmonic oscillators.

Sequences: You should be able to determine whether or not a sequence converges, and find its limit when it converges.

Series: You should be able to find the sum of a series, when possible. In particular you should be able to find the sums of geometric series and telescoping series. You should know basic properties of series. You should know when and how to use all tests for convergence, absolute convergence, and divergence. The tests are the divergence test, integral test, absolute convergence test, comparison test, alternating series test, and ratio test.

Power series: You should know how to find the interval and radius of convergence of a power series. You should be able to integrate and differentiate power series. You should be able to find power series solutions to linear homogeneous differential equations.

Terminology you should know: second order, linear, homogeneous, constant coefficient, linearly independent, linearly dependent, Wronskian, characteristic equation, partial sum, convergent, divergent, sequence, series, power series, geometric series, telescoping series, harmonic series, p-series, interval of convergence, radius of convergence, absolute convergence