

## MATH 311 Exam I (4.1 - 5.2) Review

1. Know how to solve second-order homogeneous linear differential equations.
2. Know how to solve second-order nonhomogeneous linear differential equations using the method of undetermined coefficients.
3. Know how to solve second-order nonhomogeneous linear differential equations using the method of variation of parameters.
4. Know the superposition principle and how it relates to the general solution of a second-order nonhomogeneous linear differential equation.
5. Know how to solve second-order homogeneous and nonhomogeneous Cauchy-Euler equation.
6. Know how to solve the mass-spring system when it is undamped, damped, free, and has a cosine forcing function.
7. Know to solve 2 by 2 systems of differential equations using the elimination method and using determinants.

Example exercises: Quiz & Homework questions; Ch. 4 Review Problems, #1 - 39;  
Ch. 5 Review Problems, #1 - 4