Use the following list of questions as a guide in your review of material of Math 46:

- **The exam is on Friday, 03/23/12, 11:30 am – 2:30 pm in OLMH 1208.**
- **In the exam, you have to show every step of your calculation.**
- **A cheating will cause a serious consequence even for your whole life.**

(1) What is a differential equation?
(2) What is the general solution of a differential equation?
(3) What is an initial value problem?
(4) What is a first order differential equation?
(5) What is a separable differential equation?
(6) What is a linear equation?
(7) What is a homogeneous linear equation?
(8) What is an exact equation? What is an integration factor?
(9) What is a Bernoulli equation? What is a homogeneous equation?
(10) What is a second order differential equation?
(11) What is an independent set of solutions of a second order linear homogeneous differential equation?
(12) What is the relation between the independent set of solutions and the general solutions for homogeneous linear differential equations?
(13) For second order linear differential equations, how are the solutions of the nonhomogeneous ones related with the solutions of the corresponding homogeneous equations?
(14) What is the Wronskian? What is a determinant?
(15) What is the differential equation describing an exponential growth?
(16) What is the undetermined coefficient method?
(17) What is the modification method of the undetermined coefficients?
(18) What is the variation of parameter method?
(19) How do you solve a second order linear homogeneous differential equations with constant coefficients?
(20) What is a particular solution?

**Review Problems:**

- **Chapter 4:** 23, 35, 41, 44, 46, 50.  
- **Ch 5:** 25, 30, 41, 49, 55, 64.  
- **Ch 6:** 23, 31, 34, 37, 41, 42, 50, 53.  
- **Ch 9:** 17, 18, 21, 23, 24, 30.  
- **Ch 11:** 15, 20, 21, 25, 26, 36, 44, 45, 46, 47, 48.  
- **Ch 12:** 11, 13, 19, 23.  
- **Ch 13:** 7, 12, 15.