Math 3322-001 Exam V-A November 19, 2007

Answer the problems on **separate** paper. You do not need to rewrite the problem statements on your answer sheets. Do your own work. Show **all relevant steps** which lead to your solutions. Clearly identify which problems are being submitted as the "In class" problems. Retain this question sheet so that you can answer the "Outside of class" problems. The "Outside of class" problems are due Monday, November 26, at the beginning of class.

Part A. In class: Do four of the six problems. Outside of class: Do the other two problems.

1. Find the general solution of the differential equation: $(D^2 - 2D - 3)y = 0$
2. Find the general solution of the differential equation: $(D^2 + 2D + 2)y = 0$
3. Find the general solution of the differential equation: $(D^2 - 6D - 4)y = 0$
4. Find the general solution of the differential equation: $(D^3 + 2D^2)y = 0$
5. Find the general solution of the differential equation: $(3D^3 - 2D^2 - D)y = 0$
6. Find the general solution of the differential equation: $(D^3 - D^2 - 4D - 2)y = 0$

Part B. In class: Do one of the two problems. Outside of class: Do the other problem.

7. Find the general solution of the differential equation: $(D^2 - 6D + 9)y = 2x^2 + 1$
8. Find the general solution of the differential equation: $(D^2 - 9)y = -5\cos 2x$

Part C. In class: Do two of the four problems. Outside of class: Do the other two problems.

9. Solve the initial value problem: $(D^2 - 3D + 2)y = 0;\ \ y(0) = -1,\ \ y'(0) = 1$
10. Solve the initial value problem: $(D^2 + 4D + 4)y = 0;\ \ y(0) = 1,\ \ y'(0) = -1$
11. Solve the initial value problem: $(D^2 + 9)y = 0;\ \ y(0) = -1,\ \ y'(0) = -1$
12. Solve the initial value problem: $(D^2 - 4)y = x + 2;\ \ y(0) = 1,\ \ y'(0) = 1$

Part D. Outside of class: Do the problem.

13. A 6 lb weight stretches a spring 3 feet. The weight is pulled 4" below the equilibrium position and given an initial upward velocity of 2 ft/sec. Find the motion as a function of time, given that a damping force equal to 1/8 of the velocity is present.