70 pts.

Problem 1. Find the general solution of the differential equation. If initial conditions are given, solve the initial value problem.

A.

$$x'' + 3x' + 2x = 0, \qquad x(0) = 1, \quad x'(0) = 2$$

B.

$$x'' - 4x' + 4x = 0$$

C.

$$x'' - 4x' + 29x = 0$$

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40 pts.

Problem 2. Find the general solution of the differential equation.

A.

$$D^2(D-1)(D-2)^3x = 0$$

B.

$$(D+1)^2(D^2+2D+2)^2x = 0$$

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60 pts.

Problem 3. **Use the method of Undetermined Coefficients** (either version) to find the general solution of the differential equation.

A.

$$x'' - 2x' + x = t^2$$

B.

$$x'' - 2x' + x = te^t$$

C.

$$x'' + x = \sin(2t)$$

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40 pts.

Problem 4. **Use the method of variation of parameters** to find the general solution of the differential equation.

$$x'' - 2x' + x = \frac{e^t}{t^2}$$

EXAM

Exam 2

Math 3354, Fall 2008

November 14, 2008

- Write all of your answers on separate sheets of paper. You can keep the exam questions when you leave. You may leave when finished.
- You **must** show enough work to justify your answers. Unless otherwise instructed, give exact answers, not approximations (e.g., $\sqrt{2}$, not 1.414).
- This exam has 4 problems. There are **210 points total**.

Good luck!