Ma 221   Exam II A   07S

I pledge my honor that I have abided by the Stevens Honor System.

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You may not use a calculator, cell phone, or computer while taking this exam. All work must be shown to obtain full credit. Credit will not be given for work not reasonably supported. When you finish, be sure to sign the pledge.

Score on Problem #1a _____

              #1b _____

              #1c _____

              #2a _____

             #2b _____

             #2c _____

             #2d _____

             #3 _____

Total Score   _____

1. Consider the differential equation

$$y'' + 9y = -26e^{-2x} + 9x^2 + 2\sin 3x$$

1 a (7 pts.) Find the homogeneous solution of this equation.

1 b (25 pts.) Find a particular solution of this equation.

1 c (5 pts.) Give a general solution of this equation.

2   Consider the differential equation

$$x^2y'' - 2xy' + 2y = x^2 \quad x > 0 \qquad (*)$$

2 a (**8 pts**.)   Find two linearly independent solutions of the homogeneous equation corresponding to $(*)$ and give the homogeneous solution.

2 b (**10 pts**.)   Find the Wronskian of the two linearly independent solutions you found in 2a.

2c (25 **pts**.)   Find a particular solution to $(*)$.

2 d (**5 pts**.)   Give a general solution to $(*)$.

3 (**15 pts**.)   Solve the initial value problem
$$y'' - 2y' + 5y = 0 \quad y(0) = 1 \quad y'(0) = 0$$