

Name: _____

Lecture Section ____ Recitation Section ____

Ma 221

Exam II B

08S

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

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 _____

#3 _____

Total Score _____

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1. Consider the differential equation

$$y'' + 4y' + 5y = 4e^{-3t} + \sin t$$

1 a (8 pts.) Find the homogeneous solution of this equation.

1 b (26 pts.) Find a particular solution of this equation.

1 c (6 pts.) Give a general solution of this equation.

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2 Consider the equation

$$t^2 y'' - 3ty' + 4y = t^2 \quad t > 0 \quad (*)$$

2 a (10 pts.) Find two linearly independent homogeneous solutions of this equation and verify that they are linearly independent by showing that their

Wronskian is not zero for $t > 0$.

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2 b (25 pts.) Find a general solution of (*).

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3 (25 pts.) Find a general solution of

$$4y'' - 4y' + y = 4te^{\frac{t}{2}}$$