EXAM 2 - MATH 310

Thursday, February 29

YOUR NAME:＿＿＿＿＿＿＿＿＿＿＿＿＿

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the particular solution of the initial value problem

$$y'' + 9y = 4e^{-2t}, \quad y(0) = 4, \quad y'(0) = 11.$$

2. Find the general solution of
$$y'' - 3y' - 10y = \cos 2t.$$

3. Assume given that $y_1(t) = t^{-1}$ is a solution of

$$t^2 y'' + 3ty' + y = 0, \quad t > 0.$$

Use reduction of order to find a second solution $y_2(t)$.

4. Use the method of variation of parameters to find the general solution of

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

5. Find the general solution of the nonhomogeneous third order linear differential equation

$$y''' - 3y'' + y' + 5y = 70e^{-3t}.$$