Name: _____   Sect. Number: _____

TA: _____   Sect. Time: _____

Math 20D.
Quiz 3
May 2, 2008

Answer each question completely, and show your work.
If you use extra paper, write your name on each extra page,
and staple the question page and your own added pages together.

1. (30 points) Find the Wronskian of any two linearly independent solutions of the equation
$$t^2 y'' + 2ty' + (t^2 - 4)y = 0, \qquad t \geqslant 1.$$

   (Notice: You do not *have* to find two linearly independent solutions, only their Wronskian.)

2. (35 points)

   The function $y_1(t) = t$ is a solution to the homogeneous differential equation

   $$t^2 y'' - t\, y' + y = 0, \qquad t > 0. \tag{1}$$

   Use the reduction order method to find a second solution y_2 of the equation (1), linearly independent to y_1.

   (Recall that the reduction order method assumes that the second solution has the form $y_2(t) = v(t)y_1(t)$, and then one solves an equation for the function v', and then one integrates that function to obtain v.)

3. (35 points) Use the method of undetermined coefficients to find the general solution to the equation

   $$y'' + 2y' + 5y = 13\sin(3t) + 5t.$$