Ordinary Differential Equations - 10413181

Homework No. 8

1. Find a general solution (or equivalently, a fundamental set of solutions) to the following ODEs:

   (a) $y'' - 2y' + y = 0$

   (b) $y'' - 6y' + 9y = 0$

2. Given the solution $y_1 = t^{-1}$ use reduction of order to find another solution to the ODE:

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

3. Given the solution $y_1 = e^x$ use reduction of order to find another solution to the ODE:

$$(x-1)y'' - xy' + y = 0, \quad x > 1$$

4. Use the method learned in class to give a general solution for the following inhomogeneous ODE:

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

   Hint: Remember that you need to find a general solution to the homogeneous equation, and a solution to the particuar equation. Make a "guess" about the form of the particular solution, informed by the discussion in class.