Differential Equations  
2011-2012 Fall Semester, Worksheet 3

1) Solve the differential equations
   
   a) $2y''' - 4y'' - 2y' + 4y = 0$

   b) $y'''' + 6y''' + 17y'' + 22y' + 14y = 0$.

2) If $y_1(t) = e^t$ is a solution of the homogeneous differential equation

   $(2 - t)y''' + (2t - 3)y'' - ty' + y = 0, \ t < 2$, find linearly independent other solutions use the method of reduction of order.

3) Solve initial value problem

   $y'' + 2y' + y = \sin t, \ y(0) = 2, \ y'(0) = 0, \ y''(0) = -1, \ y'''(0) = 1$.

4) Find the general solution of differential equation

   $ty'' - y'' - y' + t^2 + 4 + t \sin t$.

5) Use the method of variation of parameters to determine the general solution

   $y''' - y' = t$. 