Carnegie Mellon University
21-122, Summer Session 2012

Sixth Homework, due August 10th

1. Solve the following homogeneous equations:

   a) $y'' + 8y' + 41y = 0$

   b) $2y'' + 5y' + 3y = 0$, $y(0) = 3$, $y'(0) = -4$.

   c) $y''' - 3y'' + 2y' = 0$

   d) $y''' - 3y'' + 4y' - 2y = 0$

2. Find the complete solution to the following equations:

   a) $y'' - 2y' + y = e^{2x}$

   b) $y'' + 4y' + 4y = \dfrac{e^{-2x}}{x^3}$

   c) $y'' - 3y' + 2y = \dfrac{1}{1 + e^{-x}}$

3. A spring with a mass of 2Kg has damping constant 14, and a force of 6N is required to keep the spring stretched 0,5m beyond its natural length. The spring is stretched 1m beyond its natural length and released with zero velocity. Find the position of the mass at any time t.

4. Study for the final!