Homework Assignment #8 — Fall 2013 - MATH308

due Monday Oct 7 at the beginning of class

Topics covered : *nonhomogeneous equations and method of undetermined coefficients (corresponds to section 3.5).*

1. (a) For each of the following equations write down the form in which a particular solution should be found according to the method of undetermined coefficients. Explain how to find and what is multiplicity, s, in each case. (**You do not need to find the value of the undetermined coefficient/coefficients here**):
   i. $7y'' - 20y' - 3y = 2013e^{-3t}$;
   ii. $7y'' - 20y' - 3y = 7e^{3t}$;
   iii. $7y'' - 20y' - 3y = 7e^{3t} - 5e^{-t/7}$;
   iv. $7y'' - 20y' - 3y = e^{3t}\sin t$;
   v. $7y'' - 20y' - 21y = 71(3t-1)e^{3t}$;
   vi. $9y'' - 6y' + y = 51e^{2t}$;
   vii. $9y'' - 6y' + y = 2e^{t/3} - 2e^{t/3}\sin 2t$;
   viii. $y'' + \omega_0^2 y = 2\cos\omega t + \sin\omega t$ where $\omega^2 \neq \omega_0^2$
   ix. $y'' + \omega_0^2 y = 2\cos\omega t + \sin\omega t$ where $\omega^2 = \omega_0^2$
   x. $18y'' + 30y' + 17y = e^{-5t/6}\big(7\cos(\frac{t}{2}) + 5\sin(\frac{t}{2})\big)$

   (b) Find the general solution for equation in the item (a)(iv).

   (c) Find the general solution for equation in the item (a)(viii).

   (d) Find the general solution for equation in the item (b)(ix).