Math 3113 homework

22. (assigned 2/25) Check the posted solutions of Quiz 3 to see what you didn't know about the theory. This will help you determine what gaps you have in your knowledge of sections 3.1 and 3.2. Get fully caught up on those sections, with the homework completed. Be sure you know the recipe for writing down the general solution of $ay'' + by' + cy = 0$ for a, b, and c constants, including the case of two complex roots that we discussed in class. The first topic on Monday will be the version of this recipe for the n^{th}-order case.

23. (assigned 2/28) As many as needed from 3.3 # 1-32, including at least 2, 10, 13, 14, 23, 32 (try $\lambda = -1$). One should also be able to do problems like 33-38, although the calculations are long. Do # 37, which has a rather simple calculation.

24. (assigned 2/28) As many as needed from 3.3 # 39-42 (these are fun, sort of).

25. (assigned 3/2) 3.4 #5.

26. (assigned 3/2) Put the following functions into phase-angle form (a calculator should not be needed):
    (a) $\dfrac{3}{\sqrt{2}}\cos(2t) - \dfrac{3}{\sqrt{2}}\sin(2t)$,
    (b) $\sqrt{3}\cos(5t) + \sin(5t)$.

27. (assigned 3/4) Study the posted solutions to Quiz 4. Do 3.4 # 15, 20 (The book gives some of the solutions using decimal approximations, but I think it is better to leave the phase angle in a form using $\tan^{-1}$(something), as this gives an exact answer).

28. (assigned 3/7) Do enough of 3.5 # 1-20 to be sure that you can carry out the full calculations. Most of them take a lot of time, so don't burn too much time on it, but you should do at least one of the longer ones, say # 8 or # 18. Note that in # 7 and 8, $\sinh(x) = e^x/2 - e^{-x}/2$ and $\cosh(x) = e^x/2 + e^{-x}/2$.

    Do most or all of 21-30, as here you only need to practice the recipe (the main tasks are solving the associated homogeneous DE and then selecting the correct power x^s in the recipe, but they don't ask you to determine the numerical coefficients). In # 29, the notation just is a way of writing the characteristic polynomial, in this case it is $(\lambda - 1)^3(\lambda^2 - 4)$.

    Finally, do a couple of # 31-40, which combine the method of undetermined coefficients plus some techniques from earlier topics to solve IVP's. These are a good review of those earlier methods.