Math 3113 homework

13. (assigned 2/11) Study the posted Quiz 2 solutions. The class performance on Quiz 2 was generally not what it should be, partly due to not following the instructions of the problems. And many people even missed the repeat question from Quiz 1.

14. (assigned 2/11) Get fully caught up on the material we have studied in Chapter 1. We will begin Chapter 3 on Monday.

15. (assigned 2/14) Study the posted description of Exam I. Spend some time reading through Section 3.1, which we will finish in Wednesday's class. Do 3.1 # 17-19.

16. (assigned 2/16) Study the theory from Section 3.1 that we discussed in class. Draw a plane in 3-dimensional space and imagine that the points in it are functions (not too hard, since you can add functions and multiply them by scalars, just the way you can with vectors). Think about the fact that when two functions/vectors are linearly independent (that is, they do not point in the same or opposite directions), the set of all their linear combinations is exactly the set of points in the plane that contains them.

17. (assigned 2/16) As many as needed from 3.1 # 1-16, including at least 1, 5, 7, 15, and 16.

18. (assigned 2/21) 3.1 # 20 (one of the coefficients could be $1/\pi$), 21 (suppose you have $c_1x^3 + c_2x^2|x| = 0$. Being equal functions means they are equal for all values of x. In particular, for $x = 1$, it would say that $c_1 + c_2 = 0$, and for $x = -1$, it would say that $-c_1 + c_2 = 0$. What do these two equations tell you about c_1 and c_2?), 22, 24 (remember that $\cos(2x) = \cos^2(x) - \sin^2(x)$)

19. (assigned 2/21) As many as needed of 3.1 # 33-42. Also, use the recipe for the case of complex roots to write down general solutions of $y'' + 2y' + 5y = 0$ and $y'' + y' + y = 0$. Know the recipe, including the case of complex roots.

20. (assigned 2/21) 3.2 # 1, 3 (only one of the coefficients needs to be nonzero to achieve the linear dependence condition), 4, 6 (what are the definitions of $\sinh(x)$ and $\cosh(x)$?)

21. (assigned 2/23) Learn the definitions of linearly dependent and linearly independent if you don't know them already. Make sure that you understand what Theorems 1, 2, 4, and 5 in Section 3.2 are saying. Do 3.2 # 14, 17 (try some others from 13-20 if you judge that you need to, but the computations can be rather long, so you might want to skip finding the exact coefficients once you have the linear equations for them set up correctly), 21, 22, 23, 25 (First just check that in general, for any y_1 and y_2, $L(y_1 + y_2) = Ly_1 + Ly_2$. If y_1 and y_2 happen to satisfy $Ly_1 = f(x)$ and $Ly_2 = g(x)$, what does the general principle tell you?), 30