Math 3593H   **Honors Mathematics II Spring Semester 2013**

Assignment 3 - Due Thursday 2/14/2013

Read: Hubbard and Hubbard Section 3.2, 3.3, 3.4

Exercises:
Section 3.2 (pages 312-314): 1*, 2, 3, 4, 5a, 6*, 8, 9
Extra questions:
A. Find the equation for the tangent line at the point (2,4,8) to the curve parametrized in question 3.1.11a
B*. Find the equation for the tangent plane at the point (sin(2)+1, 3, 2) to the surface parametrized in question 3.1.25.

Section 3.3 (pages 324-326): 1, 3, 6, 9, 13*

Section 3.4 (page 333): 1, 2*, 3, 4, 5*, 6, 7*, 9
Note that question 3.4.3 is the same as 3.3.13. I can only imagine that in questions 6 and 9 you are supposed to use a form of Taylor's theorem with remainder, which they don't do here. I suppose we can still get the idea of how to obtain those Taylor polynomials.

Comments:
I think you will find the sections this week easier to understand than Section 3.1 with the three definitions of a manifold. You will probably get the idea of the tangent space immediately in Section 3.2. The most important things in Section 3.3 are Theorem 3.3.9 about equality of the mixed derivatives when second partials are continuous (but they only prove it in an appendix), the form of the multivariable Taylor polynomial, and how to compute the coefficients in 3.3.12. They spend a very long time introducing multi-exponent notation, as though it is difficult, and I am not even sure we need to trouble ourselves with it.