ECON 321, Assignment 5:
BP, Chapter 3: 3.2 and 3.3

1. Read 3.2.1, especially noting Lesson 3.5 and Figure 3.3.

2. Read 3.2.2; this is another version of what I did in class.

3. Read 3.3.1; this is a bit difficult, but familiarize yourself with it and I will talk more about it in class.

4. Read 3.3.2. Let's go back to Mathematica and our demand system

$$q_1(p_1, p_2) = a - bp_1 + dp_2 \qquad q_2(p_1, p_2) = a - bp_2 + dp_1$$

Note that in this reading, there are tildes over a, b, and d when the demand sytem is written this way.

As before, we can go one step simpler than the book and let $c_1 = c_2 = c$ (symmetric, constant marginal cost).

Set up the Cournot profit functions of firm 1 and firm 2. Note that you have to invert the demand system to do this, so it will look messy, but that's why we have Mathematica.

5. Take the first order conditions and solve for the reaction functions. You can use the kludgy method I found last time, or maybe you can figure out a more elegant way.

Solve simultaneously to find the Cournot-Nash equilibrium quantities, prices, and profits (again, all will be messy because of the inverted demand system.)

6. Consider the same parameter values from the notebooks for class 3 and 4 (as revised): $b = 2, c = 1$ and trying out $a = 10, d = 0$ then $a = 7, d = 1$, and finally $a = 13, d = -1$. Find the Cournot equilibrium prices and

quantities, and find the profits. Note how they compare to the results for monopoly and Bertrand. What do these comparisons say about the social desireability of differentiated Cournot versus Bertrand competition?

7. Read Section 3.3.3 which gets at the important art of choosing how to model firms. What do you think is the better choice for your icebreaker company you chose for the second class? Why?