ECON 321, Assignment 14:
BP Chapter 15.1 and 15.2, Cournot Mergers

1. Read the introduction and section 15.1.1 carefully.

2. Skim sections 15.1.2 and the "Scale economies" part of Section 15.1.3.

3. Read the "Synergies" part of Section 15.1.3 and section 15.2.1 carefully and use them to make a Mathematica graph sort of like Figure 15.1, but with n on the horizontal axis and x on the vertical. Here's how in more detail:

4. First, work through the Synergies section, but simplify things by setting $a = 8$, $c = 1$, and let's always consider a merger of just 2 firms, so $k = 2$. That leaves only two variables, the number of firms in the industry n and the amount of synergy x. You should get Mathematica expressions qIstar, qOstar, pstar, piIstar, piOstar. (Of course you can use your own names, whatever makes sense to you.)

5. Now the book uses a ratio ϕ, but with all our simplifications we can just concentrate on x itself, where x can vary from 0 (no synergy) to 1 (such awesome synergies that they drive costs to 0!). The goal is to compare the profits *ex ante* with the profits after the merger π_I. Note that you can find the *ex ante* profits just by setting $k = 0$ and $x = 0$ in your expressions, because this means no merger and no synergies take place.

6. Find the level of x needed to make the merger profitable as a function of n, the total number of firms in the market. Graph it.

7. Value added/extra credit: find the changes in prices as a consequence of the merger and thus the resulting consumer surplus. What levels of x are needed to raise consumer surplus? What about total surplus? How do these predictions relate to real world industries where they have been/might be mergers?