Problem set due in class Thursday, February 10

Homework is graded check/check plus/check minus. You may work on these problems together, but you should write up your answers on your own. Note that problems marked *optional* are just that—optional—and that the author's website (linked from our class homepage) has answers to exercises with a dark circle around the question mark. **Please circle your answers and otherwise make it easy for me to follow your work.**

1. Consider a duopoly game with two firms: Firm 1 has costs of $C_1(q_1) = q_1^2$ and Firm 2 has costs of $C_2(q_2) = 2q_2^2$. The inverse demand curve is $p = 23 - (q_1 + q_2)$.

   (a) Assume that the two firms collude to maximize joint profits. Determine the optimal choices of q_i and the resulting joint profits.

   (b) What is true about the marginal costs of the two firms at this optimum?

   (c) Now assume that the two firms engage in Cournot competition, and assume that there is an interior solution. Determine the Nash equilibrium(s), and compare joint profits with the collusive case.

   (d) Can you show that there are no Nash equilibriums that involve corner solutions (i.e., equilibriums in which either q_1 or q_2 take on the extreme values of 0 or ∞)?

2. Exercises 58.1, 59.2, 67.2, 68.2. (Note that exercise X.Y appears on page X of the text.)

3. Read the sidebar on Cournot, Bertrand, and Nash (pages 69–70) and write a one-sentence comment.