1. Suppose two firms both have cost function $c(q) = 5q$ and inverse demand is $p = 29 - Q$.

A. What is the profit function of each firm as a function of q_1 and q_2?

B. What is the best response function of each firm?

C. What is the the symmetric Nash equilibrium of this game?

D. What quantity should the firms set if they collude to jointly maximize profits.

E. How much extra do the firms earn by colluding?

2. Suppose there is a market with demand $Q = 1000 - 5p$. All firms in the market have the same cost function $c(q) = 10q + 100$. The firms compete in Cournot oligopoly.

A) Write down the profit function of firm i in terms of qi (firm i's quantity) and Q_{-i} (the quantity of all other firms except i).

B) Find firm i's optimal quantity in terms of Q_{-i} . That is, find i's best response function.

C) Assume all firms produce the same quantity q^*. What is the equilibrium quantity in this market when there are N firms?

D) What is the market quantity, market price, and profit of each firm when there are $N = 18$ firms?

E) What is the quantity and price under a monopoly?