

Problem Set #9

Duopoly

ACME and Zed are the only two firms in the widget industry. They face a market inverse demand for widgets given by the following equation:

$$P = 100 - \frac{1}{2}Q \quad \text{where} \quad Q = q_A + q_Z$$

The firms have identical total cost functions:

$$TC_A = 10q_A \quad \text{and} \quad TC_Z = 10q_Z$$

Given the information above:

1. Find the Cournot equilibrium.
2. Find the equilibrium that will occur if the two firms collude.
3. Find the Stackelberg equilibrium. (Assume that ACME is the leader.)
4. Compare the level of profit the firms earn in problems 1 through 3.

Now, suppose that ACME and Zed have slightly different cost functions. (You may assume that the market demand has not changed.)

$$TC_A = 2q_A \quad \text{and} \quad TC_Z = \frac{q_Z^2}{2}$$

5. Find the Price Leadership equilibrium.
6. Calculate the amount of profit each firm earns in problems 5 and 6.

Challenge Questions – You do **not** need to prepare these for the quiz, but you do need to know how to do them for the final review.

Besanko and Braeutigam – 13.23; 13.25; 13.26