

Intermediate Microeconomic Theory
Answers to Practice Oligopoly Problems

1. Cournot Equilibrium - Calculate the Cournot equilibrium price and quantities for each set of demand and cost functions.

a. $P = 100 - 4(q_1 + q_2)$, $TC_1(q_1) = 10 + 10q_1$, $TC_2(q_2) = 10 + 10q_2$: $q_1^* = q_2^* = 7.5$, $P^* = 40$

b. $P = 50 - 3(q_1 + q_2)$, $TC_1(q_1) = 5 + 2q_1^2$, $TC_2(q_2) = 10 + 3q_2$: $q_1^* = 3.12$, $q_2^* = 6.27$, $P^* = 21.83$

c. $P = 75 - 5(q_1 + q_2)$, $TC_1(q_1) = 10 + 5q_1^2$, $TC_2(q_2) = 12 + 4q_2^2$: $q_1^* = 2.91$, $q_2^* = 3.36$, $P^* = 43.65$

d. Inverse demand for firm 1's product: $P_1 = 75 - 2q_1 - q_2$

Inverse demand for firm 2's product: $P_2 = 75 - 2q_2 - q_1$

$TC_1(q_1) = 15 + 5q_1$, $TC_2(q_2) = 15 + 5q_2$: $q_1^* = q_2^* = 14$, $P^* = 33$

2. Stackelberg Equilibrium - Calculate the Stackelberg equilibrium price and quantities for the demand and cost functions in problem (b) from section 1 assuming firm 1 is the leader.

b. $q_1^* = 3.79$, $q_2^* = 5.94$, $P^* = 20.81$

3. Bertrand Equilibrium - Calculate the Bertrand equilibrium price and quantities for the demand and cost functions in problem (a) from section 1.

a. $P^* = 10$, $q_1^* = q_2^* = 11.25$