

Solutions Problem Set 5

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1 Solutions for Chapter 16

Solution for Exercise 1.

- a. Third-degree
- b. Bundling
- c. Third-degree
- d. Bundling
- e. First-degree

Solution for Exercise 2.

- a. $p^* = 35$
- b. $p_A^* = 30$
- c. $p_B^* = 45$
- d. Gain = 150

Solution for Exercise 3.

- a. $Y^* = 12, p^* = 10$
- b. $p_a^* = 12$
- c. $p_b^* = 8$
- d. 8

Solution for Exercise 4.

- a. $p_A = 40, p_B = 40, \pi = 160$

- b. Bundle $p = 100$, $\pi = 200$
- c. Bundling adds 40

Solution for Exercise 5.

- a. $p_X = 70$, $p_Y = 70$, $\pi = 140$
- b. Bundle $p = 100$, $\pi = 200$
- c. Bundling adds 60

Solution for Exercise 6.

- a. $y^* = 9$, $p^* = 11$
- b. $\pi = 81$
- c. Entry fee $T = 162$
- d. $\pi = 162$, gain 81

Solution for Exercise 7.

- a. $y^* = 10$, $p^* = 10$, $\pi = 50$
- b. Consumer surplus at $p = 5$: $CS = 100$ (this is also the entry fee)
- c. Unit price under two-part tariff $p^* = 5$
- d. 50

2 Solutions for Chapter 17

Solution for Exercise 1.

- a. $\pi_1 = q_1(50 - q_1 - q_2) - 5q_1$
 $\pi_2 = q_2(50 - q_1 - q_2) - 5q_2$
- b. Best Response 1 : $q_1 = \frac{45 - q_2}{2}$ Best Response 2 : $q_2 = \frac{45 - q_1}{2}$
- c. $q_1 = 10$
- d. $q_1 = q_2 = 15$
- e. $p = 20$

f. $\pi_1 = \pi_2 = 225$

Solution for Exercise 2.

- a. $\pi_1 = q_1(50 - q_1 - q_2) - 5q_1$
 $\pi_2 = q_2(50 - q_1 - q_2) - 5q_2$
- b. Best Response 2 : $q_2 = \frac{45 - q_1}{2}$
- c. $\pi_1(q_1) = q_1(50 - q_1 - \frac{45 - q_1}{2}) - 5q_1$
- d. $q_1 = \frac{45}{2}$
- e. $q_2 = \frac{45}{4}$
- f. $\pi_1 = \frac{45}{2}(50 - \frac{45}{2} - \frac{45}{4}) - 5\frac{45}{2} = 253.125$
 $\pi_2 = \frac{45}{4}(50 - \frac{45}{2} - \frac{45}{4}) - 5\frac{45}{4} = 126.563$ Firm 1 is higher and firm 2 is lower.

Solution for Exercise 3.

- a. $\pi_1 = q_1(140 - (q_1 + q_2)) - 20q_1$
 $\pi_2 = q_2(140 - (q_1 + q_2)) - 20q_2$
- b. $q_1 = \frac{120 - q_2}{2}$
- c. $q_1 = 50$
- d. $q_1 = q_2 = 40$
- e. $p = 60$
- f. $\pi_i = 1600$

Solution for Exercise 4.

- a. $\pi_1 = q_1(140 - (q_1 + q_2)) - 20q_1$
 $\pi_2 = q_2(140 - (q_1 + q_2)) - 20q_2$
- b. $q_2 = \frac{120 - q_1}{2}$
- c. $\pi_1(q_1) = q_1(140 - q_1 - \frac{120 - q_1}{2}) - 20q_1$
- d. $q_1 = 60$
- e. $q_2 = 30$
- f. $\pi_1 = 1800, \pi_2 = 900$