個體經濟學小考 (4/16/2012) 古慧雯

總分30分。答題皆須附說明，未做解釋的答案概不計分。

1. (3 points) In the following game, s_i denotes the pure strategy of the row player and t_i denotes the pure strategy of the column player, $i = 1, 2$. Please find all the Nash equilibrium.

	t_1	t_2
s_1	1,3	2,5
s_2	0,2	3,1

2. A manufacturer has a patent for his product which could be produced at zero cost. The market demand is: $q = 100 - p$, where q is the quantity, p is the price. The manufacturer asks 2 agents to sell the product for him. Each agent could get any quantity he wishes at the wholesale price p_w. Suppose these two agents have a Cournot competition in the retail market.

   (a) (2 points) Given p_w, please find agent 1's response function $q_1(q_2)$, where q_i is the quantity that agent i purchases from the manufacturer.

   (b) (2 points) Solve for the Cournot equilibrium. (Hint: It will be a function of p_w)

   (c) (2 points) What is the wholesale price that will maximize the manufacturer's profit?

3. Mr. X who runs a playground without any cost decides to use a two-part tariff to maximize the revenue. There are two types of customers and the individual demand for rides in the playground for each type is:

$$q_h = 100 - p,$$
$$q_l = 50 - 0.5p,$$

where p is the price per ride and q_i is the number of rides, $i = h, l$. The numbers of customers of both types are the same. Let F denote the entry fee.

$\frac{(100-P)(150-0.75P)}{2} + P(150-1.5P)$ 150×60 90×80 $\frac{60\times 30}{2}$

375×75 54 75×(150−112.5)+ 3600 900

+25×150 ~~25×37.5~~ 25×(150−37.5) 150−60 4500

$\frac{50\times 100}{2}\times 2$

1875
(a) Let's first consider the problem when Mr. X decides to serve both types of customers.

$+\frac{15000}{4}$

$= 3750$

i. (2 points) Given the price of rides p, what is the maximum entry fee F that Mr. X could charge?

check → c50m. ii. (2 points) In the optimal two-part tariff when both types of customers are served, what is the optimal price per ride p?

check (b) (2 points) Should Mr. X serve both types of customers or serve only one type? Why?

check → 4. In an election, a candidate has to choose his platform in the interval $[0, 1]$. Voters have different preferences and the distribution of their most favorable platforms has the following density function:

pdf
$$f(x) = 6x, \quad \text{for } x \in [0, 1/3].$$
$$f(x) = 3 - 3x, \quad \text{for } x \in [1/3, 1].$$

+1

A voter will vote for the candidate whose platform is closest to his/her most favorable one. In case candidates choose the same platform, they have equal probability to receive a vote. Every candidate wishes to maximize the expected percentage of votes he receives.

(a) (2 points) If there are 2 candidates, find a Nash equilibrium of their platforms.

(b) (3 points) If there are 6 candidates, find a Nash equilibrium of their platforms. (Hint: In a Nash equilibrium, for any candidate, given the platforms of his opponents', his platform is the best choice for him.)

5. A monopolist considers to engage in third-degree price discrimination in his two markets. The monthly demand in each market is:

$$q_1 = 100 - p_1,$$
$$q_2 = 80 - p_2,$$

where q_i and p_i denote the quantity and price in market i. There is no cost of production, so the monopolist simply wishes to maximize the total revenue.

(a) (2 points) Solve for p_1^* and p_2^*.

(b) Unfortunately, consumers in these two markets realize the price difference and those who purchase more cheaply start to sell to the other market. So the market with a higher price has no sales. This forces the monopolist to set a single price in two markets in the future.

i. (2 points) BEFORE solving for the optimal price, argue first that the monopolist will choose to serve both markets, i.e. $q_1, q_2 > 0$.

ii. (2 points) No matter whether you solve the previous problem, take it as given that the monopolist will serve both markets. Now solve for the optimal single price.

(c) Suppose consumers in these two markets cannot resell freely. Due to the distance between two markets, a consumer needs to pay a postage of \$4 to send the product over. So the monopolist has the chance to price-discriminate again, but he faces the constraint that $|p_1 - p_2| \leq 4$.

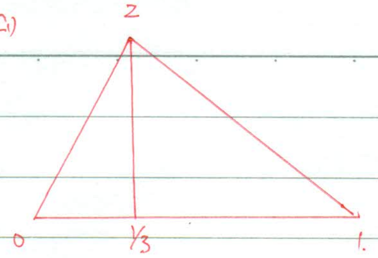
i. (2 points) Argue that p_1 cannot be higher than the p_1^* you solve in part (a).

ii. (2 points) Solve for the optimal prices.

2012.

Micro Mid-term

4. (a)



要站在面積

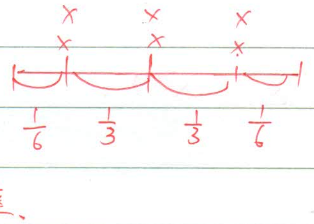
CDF 積起來是$\frac{1}{2}$的地方

兩人要站在同一點

$\therefore (1-x)(3-3x)/2 = \frac{1}{2}$

可求得 x

(b).

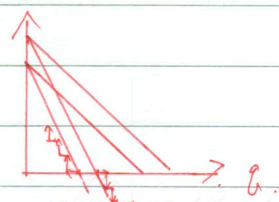


分三組站

但中間的數以決定

不存在, ∵ CDF換去不伴去吃就會轉虛比～

7. (a)



$p_1^* = 70$

$p_2^* = 40$

(b). (i) 一定要管兩個 mkt, ∵ 若只管一個 price ≥ 80,

開始降價 $MR_1 > 0$, $MR_2 > 0$ ∴ ok!!

「你要分散也給你, 好。」 ((贊!!

(ii) 寫出平均總後的 MR, 令 MR=0, 可解出 $p=45$.

(c) (i) $|p_1 - p_2| \le 4$.

$40 \le p_2$, $p_1 \le 70$

(ii) 做因降分析 ∴ 是兩邊往內靠

1.

		t_1 $\frac{1}{2}$ (q)	t_2 $\frac{1}{2}$ ($1-q$)
$\frac{1}{3}$	p s_1	1,2	2,1
$\frac{2}{3}$	$1-p$ s_2	0,2	3,1

沒有單純策略

去算混合策略

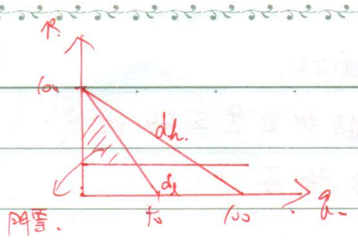
2. given P_w.

agent 1. $\max\ q_1 \times (100-(q_1+q_2)) - P_w$. $\Rightarrow$ solve q_1, $= (100 - P_w - q_2)/2$

$\Rightarrow q_1 = q_2 = \frac{100-P_w}{3}$

~~given~~ ∴ manufacturer: $\max\ \left(\frac{100-P_w}{3}\right) \times 2 \times P_w$.

3. (i)

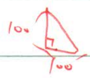


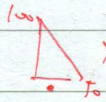
$$\frac{(100-P)(50-0.5P)}{2}$$

(ii) $2\times\frac{(100-P)(50-0.5P)}{2}+(150-1.5P)\cdot P$ 收入

最适的P，去解极大值 = 25

(b). 若只吸引一种 ⇒ 吸引中高需求的.

收入就是 

若考虑两种都只收门票 ⇒ 

×2 = 

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