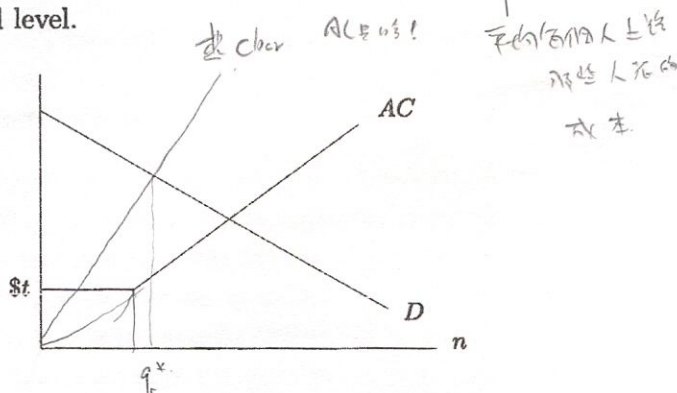1. (4 points) Drivers have different willingness to pay to use the highway. Let n denote the number of drivers. In the following graph, D shows the demand for highway usage. The highway toll is currently \$$t$ as shown in the graph. As more and more drivers use the highway, congestion occurs, and the average cost (AC) to use the highway starts to increase when the number of cars on the highway passes a critical level.

Please replicate the graph on your answer sheet and determine the optimal number of cars on the highway and the optimal toll. (Note: The setting is not exactly the same as Group 8's.)

2. Mr. A is a monopolist in the market and he faces the market demand:

$$q = 100 - p.$$

Two kinds of factors are used and the production function is:

$$q = x_1 + x_2,$$

where x_i is the amount of the ith factor.

   (a) (2 points) Please derive the marginal revenue product of x_2. (It should be expressed as a function of x_1 and x_2.)

   (b) (2 points) In the short run, x_1 is fixed to be 10 units, and x_2 could be adjusted freely. Let p_2 denote the unit price of x_2. Mr. A is a price taker in the factor market. Please derive his short-run demand for x_2.

(c) (2 points) The unit price of the 1st factor is $10. In the long run, both x_1 and x_2 could be adjusted freely. Please derive Mr. A's long-run demand for x_1.

3. Mr. A considers to invest in two shares, X and Y. He expects a return of 12% from X and 8% from Y. The standard deviation of the returns is 8% for X and 5% for Y. The correlation coefficient between the returns is 0.2. If he invests some of his money in X, and the remaining of his money in Y, curve C shows the possible combinations of the expected return and the standard deviation of the return. (Put the standard deviation on the horizontal axis and the expected return on the vertical axis, and draw the curve for yourself.)

(a) (4 points) If Mr. A splits his money equally between X and Y to invest, what are the expected return and the standard deviation of the return? ($\sqrt{0.0105} \simeq 0.102$)

(b) (3 points) Let Z denote the coordinates that you calculate in the previous problem. What is the slope of curve C at Z?

4. (2 points) In Ch'ing dynasty Taiwan, a tenant usually paid his landlord a fixed amount of rental (定額租) every year. Suppose the rental for a given piece of land is R for a year. It's now the beginning of a year, and a landlord will receive the rental only at the end of year. The annual market interest rate is i, $i > 0$. What is the equilibrium market price for this piece of land?

5. (6 points) It's interesting to note that not all pieces of land were sold unconditionally (絕賣) in Ch'ing dynasty Taiwan. Quite often, a seller of a piece of land had an option of repurchasing (or redeeming) it at the same price in the future. The custom was named Dian (典賣). Researchers find that subjecting a parcel of land to Dian reduced its market value to 60 to 80 percent of its value without Dian. Suppose a landlord wishes to raise $K. There are 3 options: (1) To Dian his land at a price of $K with the option that he could purchase it back 10 years later at the same price. (2) To sell the same piece of land at a full price of $5K/4. (3) To borrow $K for 10 years and the market interest rate is i, $i > 0$. We assume the market is perfect and one could always sell/buy anything he wishes at the market price. Which option is the most appealing financially?

6. (2 points) The following is from *The Economist*, June 9th, 2012, pp.59-60.

> Bandits, terrorists, clan rivalries, lawless security forces and corrupt officials make Russia's north Caucasus the murkiest part of an often opaque country. Journalism there is difficult and dangerous. Much of the best reporting is done by Caucasian Knot... which was set up in 2001 with a donation from George Soros's Open Society Institute.

Please use economics to comment the following statement. "Caucasian Knot makes no profit, so Mr. Soros's money spent on a loser in the market is unwisely wasted."

7. Recall the lecture delivered by Professor Maskin. Irrationality on the part of bankers is ruled out as a cause to the financial crisis. Instead, it is argued that a bank taking on leverage might exert an externality on other banks, and hence regulation is called for. Suppose that there is an entrepreneur needs to raise $1,000 to implement his new idea. Bank A realizes that this project generates an expected return of 20% to investors. Since Bank A only has $100, it borrow $900 from Bank B to finance the entrepreneur's project. Bank A expects the entrepreneur to return $1,200 in the future and after returning $900 to Bank B, Bank A expects to have $300. The expected return is hence 200% to Bank A. Because of the high expected return, Bank A is very keen to take the risk. But actually Bank A bets on this project with Bank B's money. The risk-taking behavior has a negative externality on Bank B.

   (a) (2 points) Find a way to argue that such a story is not coherent, and Bank A does not exert any externality on Bank B.

   (b) (2 points) The scholars on banking are highly concerned about the leverage and externality that it causes. If Bank A does not exert any externality on Bank B when taking on leverage, on whom does Bank A exert an externality?

Exam201206`b.ctx

Micro II. final!

7. (a) 一開始說 銀行是彈性的,
B 當然免這 A 要 take risk.
∴ 事實上, A 為 B 的 契約 也 會把月考慮也去.

差:「除非 B 是筆層」

(b). 李怡庭:「一定得有個筆層」

Ex: 又有銀行 C, 那把 放了 A 的 $900,
那 C 一定有其他 的 投資管道 ……
但此時 A 去擠兌 C 了, C 擠兌…… 一路擠兌下去.
B 一定知道 A 是因 李去投資, 但 C 是事前免不知道未來會發生 leverage.
C 銀行在接受存款 的時候 不會想到有 A 突然提 $900 之 種事.
∴ 以前 leverage 都做很小.

contract.
Good idea ← A ⟷ B
↓
$900
Bank C.

6. 「慈善新聞業」, 要求捐書者 不能 干涉報業,
很明現 是個賠本 的生意.
而新聞 是個 不發財, ∴他的 的衡數 是可能是偏低的
∴ Soros 是在 correct 市場 失靈.
「資本家庭後是像之樣, 你們愛怎樣花 丼怎樣花」

5. 「縱觀不同, Taiwan 為何 會有 『典』?」
什麼 金融 制度 replace 「典」?!

{ 外國人說:「∴有典」∴中國 在 19 th 被 外國 欺負.
⇒ 拿 這個 來 批評 中 發現 典不好, ∵ 土地 制度 不 clear …

芭媽:「很糟 的 explain …」

(1) 典 地   吲瞅 假 使 在 n 年 之後 贖回了.
(2) 胞售 割k.
          104.