



一、Microeconomics:

ANSWER THE FOLLOWING QUESTIONS POINTEDLY. EACH QUESTION IS WORTH 5 POINTS.

1. Many products, such as drugs, are illegal. What do you think would happen to the price of an illegal product if it were legalized?
2. Let income in state 1 be Y_1 and income in state 2 be Y_2 . If both state 1 and state 2 have the probability of $1/2$, and $U(Y_i) = Y_i$, draw the indifference curves in the state space. Is the agent risk-averse?
3. Let uncertain prospect A be $(\$100, \$10; 2/5)$. Where $(x, y; \pi)$ represents a situation in which x occurs with probability π and y occurs with probability $1-\pi$. Now define uncertain prospect B as $(\$100, A; 1/2)$. What is the probability of winning \$100 in prospect B?
4. Assume that the marginal-utility schedules for goods X and Y are independent and subject to the law of diminishing marginal utility. Can either good X or good Y be an inferior good? Illustrate your answer.
5. Suppose that there are 100 identical people each with the demand curve
 $Q = 10 - 2P$. Compute the equilibrium price when supply is fixed at
 $S = 400$.
6. Suppose MP_K is never zero but $MP_L = 0$ whenever L exceeds or equals K. Draw the isoquant map and the economic region of production.
7. Suppose labor costs \$20 an hour. An extra hour of labor yields 10 brooms. To make 10 brooms, \$30 worth of material is required. What is the marginal cost of a broom?
8. Can perfect competition exist if some managers are smarter than others and achieve lower levels of costs? Why or why not?
9. Assume a monopolist sells a product in two separate markets. The demand curve in market 1 is $P_1 = 10 - Q_1$ and market 2 is $P_2 = 20 - Q_2$. If $MC = \$2$, determine the monopolist profit.
10. Suppose a Cournot oligopoly consists of two firms, each of which faces a constant marginal cost of \$1. The market demand curve is $P = 10 - Q$. What is the Cournot equilibrium?



二、Macroeconomics:

題目共四大題，其中包含十個小題，每一小題分數各為 5 分。

1. 假設一封閉經濟，其經濟可簡單描繪如下：

$$\text{消費函數: } C=200+0.25(Y-T)$$

$$\text{投資函數: } I=150+0.25Y-1000i$$

$$\text{政府購買: } G=250$$

$$\text{定額淨稅賦: } T=200$$

$$\text{貨幣需求: } (M/P)^d=2Y-8000i$$

$$\text{貨幣供給: } M/P=1600$$

其中 Y 為實質產出， i 為利率。

- 請導出 IS 曲線的斜率
- 請導出 LM 曲線的斜率
- 請求出均衡的實質產出與利率

2. 設某國央行之資產為 3000 元政府公債，負債則為 2600 元的通貨以及 400 元的商銀準備性存款。

- 假定商銀不持有通貨，亦無超額準備，存款準備率為 20%，則該國之貨幣供給量為多少？
- 設商銀不持有任何超額準備，而央行想藉由調整存款準備率以降低貨幣供給量至 4200 元，存款準備率須設定為多少？
- 設商銀不持有任何超額準備，而央行想藉由公開市場操作以降低貨幣供給量至 4000 元，其必須如何操作？

3. 如果電腦和紹興酒在台灣及中國大陸的勞動投入如下所示：

	台灣	大陸
電腦	11 人日	12 人日
紹興酒	3 人日	4 人日

人日為勞動投入單位。

- 台灣及大陸的比較利益為何？
- 若電腦的國際價格為每台 12000 元，而紹興酒價格每瓶 3300 元，則台灣與大陸的工資各為何？



4. 根據新古典成長模型，假設經濟體之生產函數 $Y = K^{1/3}N^{2/3}$ ，且儲蓄率 s 和折舊率 δ 均等於 0.10
- 穩定狀態之平均每位勞工資本及產出水準為何？
- 設經濟體在 t 期已達穩定狀態，在 $t+1$ 期後，折舊率增至 0.2
- 計算在折舊率改變之後，前二期之平均每位勞工資本和平均每位勞工產出的路徑



一、填充題：

共有八大題，其中，包含 12 小題，每小題分數各為 5 分，共 60 分。

1. Bowl A contains two red chips; bowl B contains two white chips; and bowl C contains one red chip and one white chip. A bowl is selected at random (with equal probabilities), and one chip is taken at random from the bowl.
 - (a) Compute the probability of selecting a white chip. _____
 - (b) If the chip selected is white, compute the conditional probability that the other chip in the bowl is red. _____

2. Let Y be the number of defectives in a box of 50 articles taken from the output of a machine. Each article is defective with probability 0.01. What is the probability that $Y=0,1,2,$ or 3 using the Poisson approximation? _____

3. Let X_1, X_2, \dots, X_n be a random sample from distribution with the probability density function $f(x; \theta) = (1/\theta^2)xe^{-x/\theta}$, $0 < x < \infty, 0 < \theta < \infty$. Find the maximum likelihood estimator $\hat{\theta}$. _____

4. Let Y be $b(100, p)$. To test $H_0: p = 0.08$ against $H_1: p < 0.08$, we reject H_0 and accept H_1 if and only if $Y \leq 6$.
 - (a) Determine the significance level α of the test. _____
 - (b) Find the probability of the type II error if in fact $p = 0.04$. _____



5. In May the fill weights of a "6-pound" boxes of laundry soap had a mean of 6.13 pounds with a standard deviation of 0.095. The goal was to decrease the standard deviation. The company decide to adjust the filling machines and then test $H_0: \sigma = 0.095$ against $H_1: \sigma < 0.095$. In

June a random sample of size $n=20$ yielded $\bar{x}=6.10$ and $s=0.065$.

(a) At an $\alpha = 0.05$ significance level, was the company successful?

(Also write the critical region and the observed value of the test statistic) _____

(b) What is the approximate p -value of your test? _____

6. You run an regression. The result is the following:

Source	SS	df	MS
Model	1494.74848	1	1494.74848
Residual	2005.25152	8	250.65644
Total	3500.00	9	388.888889

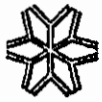
wage	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
educ	2.874516	1.177118	2.44	0.040	.1600764 5.588956
_cons	-3.955777	17.11078	-0.23	0.823	-43.41331 35.50176

(a) What is the value of R^2 ? _____

(b) Calculate the sum of residuals. _____

7. The existence of high correlation between two or more independent variables in a multiple regression model is called _____.

8. A bank officer wishes to estimate the amount of the average total deposits per customer at the bank. She wishes the estimate to be within \$200 of the actual average with 95% confidence. She assumes the standard deviation for this should be \$1000. How large should the sample be? _____



二、計算題：

共有三大題，其中，包含 8 小題，每小題分數各為 5 分，共 40 分。

注意事項：必須列出計算過程或說明理由，否則不計分。

1. Let $S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}$ denote the sample variance of a random sample of

n observations from a population with normal distribution $N(\mu, \sigma^2)$.

Then

(a) find $Var(S^2) = ?$

(b) Assume $n=20$. Find K_1 such that

$$P\left(\frac{S^2}{\sigma^2} < K_1\right) = 0.01.$$

2. Two brands of refrigerators, denote A and B, are each guaranteed for one year.

(a) In a random sample of 50 refrigerators of brand A, 12 were observed to fail before the guarantee period. Find a 95% confidence interval for the population proportion.

(b) From a random sample of 50 refrigerators of brand B, a statistician constructed a confidence interval running from 0.17 to 0.23 for the population proportion of failures. Find the level of confidence of this interval.

(c) Based on the information in (a) and (b), find a 90% confidence interval for the difference between the population proportions of failures between refrigerators of brands A and B during the guarantee period.



3. The table below shows retail sales and advertising expenditures for a retail store.

sales(\$)	advertising(\$)
4,000	350
5,250	475
6,800	560
6,450	540
7,800	610
7,550	590

Let $Y_i = \alpha + \beta X_i + \varepsilon_i$, $i = 1, 2, \dots, 6$, R^2 ,

Where $Y = \text{sales}$,
 $X = \text{advertising}$,

$\alpha, \beta = \text{regression coefficients}$,

$\varepsilon = \text{error term} \stackrel{iid}{\sim} N(0, \sigma^2)$.

(a) Estimate α and β by the method of least square.

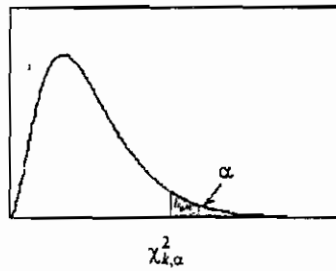
(b) Test the null hypothesis: $\beta = 0$ against the alternative $\beta > 0$, at 5% significance level.

(c) Construct a 95% confidence interval for β .



附表 3 = 卡方分配表

$$P(\chi_k^2 \geq \chi_{k,\alpha}^2) = \alpha$$

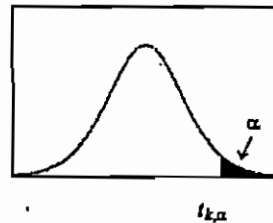


自由度	單尾 著水準							
	0.99	0.975	0.95	0.9	0.1	0.05	0.025	0.01
1	0.0002	0.0010	0.0039	0.0158	2.7055	3.8415	5.0239	6.6349
2	0.0201	0.0506	0.1026	0.2107	4.6052	5.9915	7.3778	9.2103
3	0.1148	0.2158	0.3518	0.5844	6.2514	7.8147	9.3484	11.3449
4	0.2971	0.4844	0.7107	1.0636	7.7794	9.4877	11.1433	13.2767
5	0.5543	0.8312	1.1455	1.6103	9.2364	11.0705	12.8325	15.0863
6	0.8721	1.2373	1.6354	2.2041	10.6446	12.5916	14.4494	16.8119
7	1.2390	1.6899	2.1674	2.8331	12.0170	14.0671	16.0128	18.4753
8	1.6465	2.1797	2.7326	3.4895	13.3616	15.5073	17.5346	20.0902
9	2.0879	2.7004	3.3251	4.1682	14.6837	16.9190	19.0228	21.6660
10	2.5582	3.2470	3.9403	4.8652	15.9872	18.3070	20.4831	23.2093
11	3.0535	3.8158	4.5748	5.5778	17.2750	19.6751	21.9200	24.7250
12	3.5706	4.4038	5.2260	6.3038	18.5494	21.0261	23.3367	26.2170
13	4.1069	5.0087	5.8919	7.0415	19.8119	22.3621	24.7356	27.6883
14	4.6604	5.6287	6.5706	7.7895	21.0642	23.6848	26.1190	29.1413
15	5.2294	6.2621	7.2609	8.5468	22.3072	24.9958	27.4884	30.5779
16	5.8122	6.9077	7.9616	9.3122	23.5418	26.2962	28.8454	31.9999
17	6.4078	7.5642	8.6718	10.0852	24.7690	27.5871	30.1910	33.4087
18	7.0149	8.2308	9.3905	10.8649	25.9894	28.8693	31.5264	34.8053
19	7.6327	8.9066	10.1170	11.6509	27.2036	30.1435	32.8523	36.1908
20	8.2604	9.5908	10.8508	12.4426	28.4120	31.4104	34.1696	37.5662
21	8.8972	10.2829	11.5913	13.2396	29.6151	32.6705	35.4789	38.9321
22	9.5425	10.9823	12.3380	14.0415	30.8133	33.9244	36.7807	40.2894
23	10.1957	11.6885	13.0905	14.8479	32.0069	35.1725	38.0757	41.6384
24	10.8564	12.4012	13.8484	15.6587	33.1963	36.4151	39.3641	42.9798
25	11.5240	13.1197	14.6114	16.4734	34.3816	37.6525	40.6465	44.3141
26	12.1981	13.8439	15.3791	17.2919	35.5631	38.8852	41.9232	45.6417
27	12.8786	14.5733	16.1513	18.1138	36.7412	40.1133	43.1944	46.9630
28	13.5648	15.3079	16.9279	18.9392	37.9159	41.3372	44.4607	48.2782
29	14.2565	16.0471	17.7083	19.7677	39.0875	42.5569	45.7222	49.5879
30	14.9535	16.7908	18.4926	20.5992	40.2560	43.7729	46.9792	50.8922
35	18.5089	20.5694	22.4650	24.7967	46.0588	49.8018	53.2033	57.3421
40	22.1643	24.4331	26.5093	29.0505	51.8050	55.7585	59.3417	63.6907
45	25.9013	28.3662	30.6123	33.3504	57.5053	61.6562	65.4102	69.9568
50	29.7067	32.3574	34.7642	37.6886	63.1671	67.5048	71.4202	76.1539
60	37.4849	40.4817	43.1879	46.4589	74.3970	79.0819	83.2976	88.3794
70	45.4418	48.7576	51.7393	55.3290	85.5271	90.5312	95.0231	100.4252
80	53.5400	57.1532	60.3915	64.2778	96.5782	101.8795	106.6286	112.3288
90	61.7541	65.6466	69.1260	73.2912	107.5650	113.1453	118.1359	124.1163
100	70.0648	74.2219	77.9295	82.3581	118.4980	124.3421	129.5612	135.8067
200	156.4320	162.7280	168.2786	174.8353	226.0210	233.9943	241.0579	249.4451
300	245.9725	253.9123	260.8781	269.0679	331.7885	341.3951	349.8745	359.9064
400	337.1553	346.4818	354.6410	364.2074	436.6490	447.6325	457.3055	468.7245
500	429.3875	439.9360	449.1468	459.9261	540.9303	553.1268	563.8515	576.4928



附表4: t分配表

$$P(t_k \geq t_{k,\alpha}) = \alpha$$



自由度	單尾顯著水準						
	0.1	0.05	0.025	0.01	0.005	0.0025	0.001
1	3.0777	6.3138	12.7062	31.8205	63.6567	127.3213	318.3088
2	1.8856	2.9200	4.3027	6.9646	9.9248	14.0890	22.3271
3	1.6377	2.3534	3.1824	4.5407	5.8409	7.4533	10.2145
4	1.5332	2.1318	2.7764	3.7469	4.6041	5.5976	7.1732
5	1.4759	2.0150	2.5706	3.3649	4.0321	4.7733	5.8934
6	1.4398	1.9432	2.4469	3.1427	3.7074	4.3168	5.2076
7	1.4149	1.8946	2.3646	2.9980	3.4995	4.0293	4.7853
8	1.3968	1.8595	2.3060	2.8965	3.3554	3.8325	4.5008
9	1.3830	1.8331	2.2622	2.8214	3.2498	3.6897	4.2968
10	1.3722	1.8125	2.2281	2.7638	3.1693	3.5814	4.1437
11	1.3634	1.7959	2.2010	2.7181	3.1058	3.4966	4.0247
12	1.3562	1.7823	2.1788	2.6810	3.0545	3.4284	3.9296
13	1.3502	1.7709	2.1604	2.6503	3.0123	3.3725	3.8520
14	1.3450	1.7613	2.1448	2.6245	2.9768	3.3257	3.7874
15	1.3406	1.7531	2.1314	2.6025	2.9467	3.2860	3.7328
16	1.3368	1.7459	2.1199	2.5835	2.9208	3.2520	3.6862
17	1.3334	1.7396	2.1098	2.5669	2.8982	3.2224	3.6458
18	1.3304	1.7341	2.1009	2.5524	2.8784	3.1966	3.6105
19	1.3277	1.7291	2.0930	2.5395	2.8609	3.1737	3.5794
20	1.3253	1.7247	2.0860	2.5280	2.8453	3.1534	3.5518
21	1.3232	1.7207	2.0796	2.5176	2.8314	3.1352	3.5272
22	1.3212	1.7171	2.0739	2.5083	2.8188	3.1188	3.5050
23	1.3195	1.7139	2.0687	2.4999	2.8073	3.1040	3.4850
24	1.3178	1.7109	2.0639	2.4922	2.7969	3.0905	3.4668
25	1.3163	1.7081	2.0595	2.4851	2.7874	3.0782	3.4502
26	1.3150	1.7056	2.0555	2.4786	2.7787	3.0669	3.4350
27	1.3137	1.7033	2.0518	2.4727	2.7707	3.0565	3.4210
28	1.3125	1.7011	2.0484	2.4671	2.7633	3.0469	3.4082
29	1.3114	1.6991	2.0452	2.4620	2.7564	3.0380	3.3962
30	1.3104	1.6973	2.0423	2.4573	2.7500	3.0298	3.3852
35	1.3062	1.6896	2.0301	2.4377	2.7238	2.9960	3.3400
40	1.3031	1.6839	2.0211	2.4233	2.7045	2.9712	3.3069
45	1.3006	1.6794	2.0141	2.4121	2.6896	2.9521	3.2815
50	1.2987	1.6759	2.0086	2.4033	2.6778	2.9370	3.2614
60	1.2958	1.6706	2.0003	2.3901	2.6603	2.9146	3.2317
70	1.2938	1.6669	1.9944	2.3808	2.6479	2.8987	3.2108
80	1.2922	1.6641	1.9901	2.3739	2.6387	2.8870	3.1953
90	1.2910	1.6620	1.9867	2.3685	2.6316	2.8779	3.1833
100	1.2901	1.6602	1.9840	2.3642	2.6259	2.8707	3.1737
200	1.2858	1.6525	1.9719	2.3451	2.6006	2.8385	3.1315
300	1.2844	1.6499	1.9679	2.3388	2.5923	2.8279	3.1176
400	1.2837	1.6487	1.9659	2.3357	2.5882	2.8227	3.1107
500	1.2832	1.6479	1.9647	2.3338	2.5857	2.8195	3.1066
600	1.2830	1.6474	1.9639	2.3326	2.5840	2.8175	3.1039
700	1.2828	1.6470	1.9634	2.3317	2.5829	2.8160	3.1019
800	1.2826	1.6468	1.9629	2.3310	2.5820	2.8148	3.1005
900	1.2825	1.6465	1.9626	2.3305	2.5813	2.8140	3.0993
1000	1.2824	1.6464	1.9623	2.3301	2.5808	2.8133	3.0984



1. 若函數 $y = \frac{(3x^r + 2x^3)}{rx^3}$ 有水平漸近線 $y = \frac{5}{3}$ 存在，求 r 值為何？
(10%)
2. 請判斷 $f(x) = |x^2 - 6x + 8|$ 在 $x = 2$ 點上是否可微分？請把判斷步驟詳細寫出。
(10%)
3. 求曲線 $y = \ln \sec x$ 從點 $(0,0)$ 到點 $(\frac{\pi}{3}, \ln 2)$ 之間的長度。
(10%)
4. 求 $\int_0^1 \frac{x}{\sqrt{1-x^2}} dx = ?$
(10%)
5. 找出級數 $\sum_{k=1}^{\infty} \frac{3^k}{k} (2x-1)^k$ 的收斂區間。
(10%)
6. 求(1) $\frac{d}{dx} x^{\sqrt{x}} = ?$
(5%)
 求(2) $\int \ln^2 x dx = ?$
(5%)
7. 令 $f(x) = \sqrt[3]{x}(x-7)^2$ ，求 $f(x)$ 的相對極大與相對極小
(10%)
8. 假定某產品的需求方程式為 $q = 800 - 4p^2$ ，請問 $p=10$ 時的需求彈性為多少？
(10%)
9. 欣欣公司為鮮果汁和牛奶的製造廠商，假定其所製造的鮮果汁的價格 (P_1) 和數量 (Q_1) 關係為： $P_1 = 1000 - 2Q_1$ ，牛奶的價格 (P_2) 和數量 (Q_2) 的關係為： $P_2 = 500 - Q_2$ ，生產這兩項產品的總成本為： $C = 20 + 2Q_1 + Q_2 + Q_1Q_2$ ，公司經營的目標為利潤極大化。請問在這個目標下，公司應該生產多少這兩種產品？
(10%)
10. 某項產品的總需求函數為 $P = \sqrt{90000 - 5x^2}$ ，請問當 $P=300$ 時的消費者剩餘為多少？
(10%)



一、申論題：

1. 國內金融一業成立金融控股公司為政府既定政策，業界亦如火如荼的申請，並展開各項作業，請問：(25分)
 - (1) 何謂金融控股公司？設立金融控股公司的目的為何？為何政府的政策為設立金融控股公司，而不是選擇策略聯盟或購併？
 - (2) 申請設立金融控股公司需要具備哪些條件？請舉一家你所熟悉的金融控股公司做說明。
 - (3) 金融業所面對的主要風險有哪些(請各舉一個例子加以說明)？金融業應如何管理這些風險？
 - (4) 設立金融控股公司和風險管理有什麼關係？設立金融控股公司之後，可能會另外產生哪些道德風險(moral hazard)問題？如何解決這些道德風險問題？
2. 國內上市、上櫃公司設置外部董監(亦即獨立董監)制度已是既定方針，證交所亦正在規劃實施中，請問：(25分)
 - (1) 何謂外部董監？設立外部董監是否表示過去國內上市、上櫃公司的董監事機制沒有發揮其應有的功能？為什麼？
 - (2) 設置外部董監的目的，事實上和解決代理問題有關？請就管理者與股東、股東與債權人的觀點說明國內上市公司可能有哪些代理問題？
 - (3) 外部董監制度屬於公司治理(corporate governance)的一部份，公司治理和企業的競爭力有什麼關係？除外部董監之外，還有哪些公司治理制度可以治理上市、上櫃公司？



二、簡答題：每題十分

1. 投資股票時，常用到所謂的「基本分析」與「技術分析」，請隨意舉出三種基本與技術指標：
2. 根據報導，台灣的「債券型共同基金」因央行連續降低利率，而大幅成長，其成長來源主要出自於兩個體系，請問這兩個體系為何？
3. 為了因應加入 WTO，財政部擬定了一些方案以使得台灣的證券市場與國際證券市場接軌，請簡單敘述這些方案。
4. 目前政府正積極規劃「不動產證券化」，請簡單敘述其方向。
5. 財政部對本國銀行去大陸設立分行一事有所保留，請簡單敘述其顧慮重點。