個經作業

1. Landsburg, Ch. 17,problem set, 6 (10% is the annual rate.)

2. Landsburg, Ch. 17, problem set, 15 (You could assume a linear market demand.)

3. Landsburg, Ch. 17, problem set, 20

4. 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. 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?

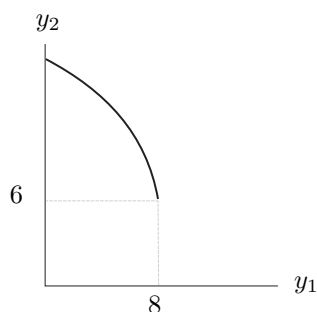6. X 獨居荒島兩期, 島上有果樹1株, 第一期結果8個, 第二期結果6個。X 可以將第一期的果子收藏起來, 第二期再享用。令 c_1、c_2 表第一、二期 X 的消費數量, X 之跨期效用函數爲:

$$u = \min\{c_1, c_2\}$$

(a) 請在 $c_1 - c_2$ 平面上繪出 X 的無異曲線。(可先嘗試比較 (c_1, c_2) 爲 (3,2)、(2,3)、(2,2) 的效用。)

(b) 請在 $c_1 - c_2$ 平面上繪出 X 的預算線, 並標明斜率。

(c) X 第一期會吃幾個果子?

7. 承前題, 除了將果子存於儲藏室外, X 發現若第一期的果子不消費而埋在地下, 第二期地下的果子會長出新果子。令 y_1 為第一期吃掉的果子, 埋了 $8 - y_1$ 的果子, 第二期的總收穫 (包括原先自然生長的6個) 量為 y_2。$y_2(y_1)$ 如下圖粗線所示:

已知

$$\frac{dy_2}{dy_1}\big|_{y_1=8} = -2, \quad \frac{dy_2}{dy_1}\big|_{y_1=0} = -1.1$$

(a) 請繪圖說明 X 第一期的消費 c_1 為何。

(b) 若耕種以外, X 尚有借貸機會, 跨期利率為20%。請繪圖決定X 第一期的消費 c_1。

解答

1 Rent costs \$18,000/year, therefore with a market interest rate of 10 percent and constant rent the cost of renting forever is \$180,000. The discrepancy suggests that the market must be anticipating a rise in rents, so the statement is likely to be true. There is another possibility, however, and that is that the market anticipates a fall in the interest rate, which would raise the present value of a constant stream of rents.
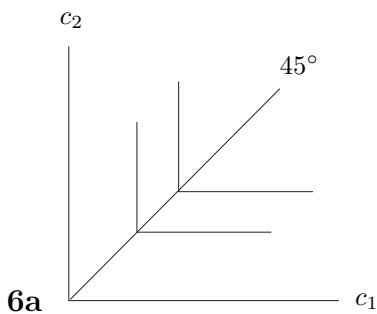
2 False. The exact opposite is true. The monopolist wants his marginal revenue to grow at the rate of interest. Because the marginal revenue curve is steeper than the demand curve, a given rise in marginal revenue corresponds to a smaller rise in price. Because price starts out higher than marginal revenue and increases by less than does marginal revenue, the percentage change in price must be less than the percentage change in marginal revenue. Thus the monopolist controls availability so that price rises more slowly than the rate of interest.
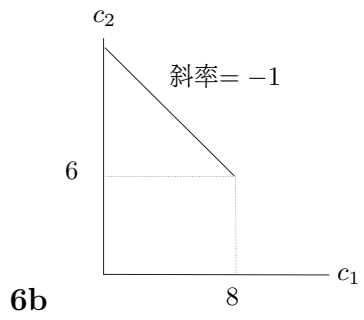
3 False. The representative agent is poorer now, and has a lower demand curve for current consumption. If his current consumption quantity is Q, then $Q - 1000$ corresponds to 20% on the old demand curve. It must correspond to something less than 20% on the new demand curve.

4 R/i

5 (1) is worse than (2). (2) gets \$K/4 more now. When the seller in (1) redeems the land, he only pays \$K. He needs to pay \$K/4 more in (2) for a repurchase. But the present value of this \$K/4 is less than \$K/4.
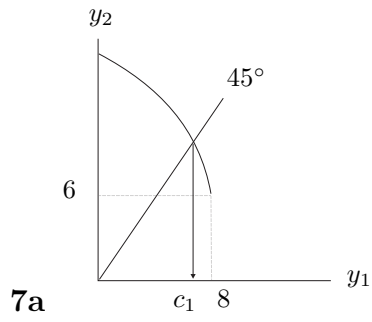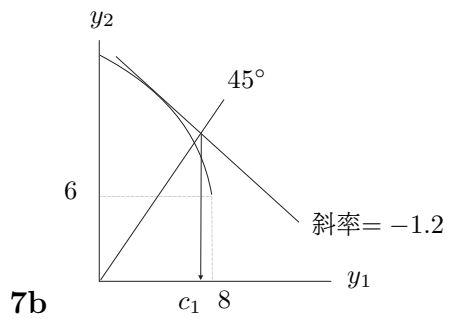(2) and (3) are equivalent. So why was Dian so popular in Ch'ing dynasty?

6a

6b

c_2

斜率$= -1$

6

8

c_1

6c 7

7a

y_2

45°

6

c_1 8

y_1

7b

y_2

45°

6

斜率$= -1.2$

c_1 8

y_1