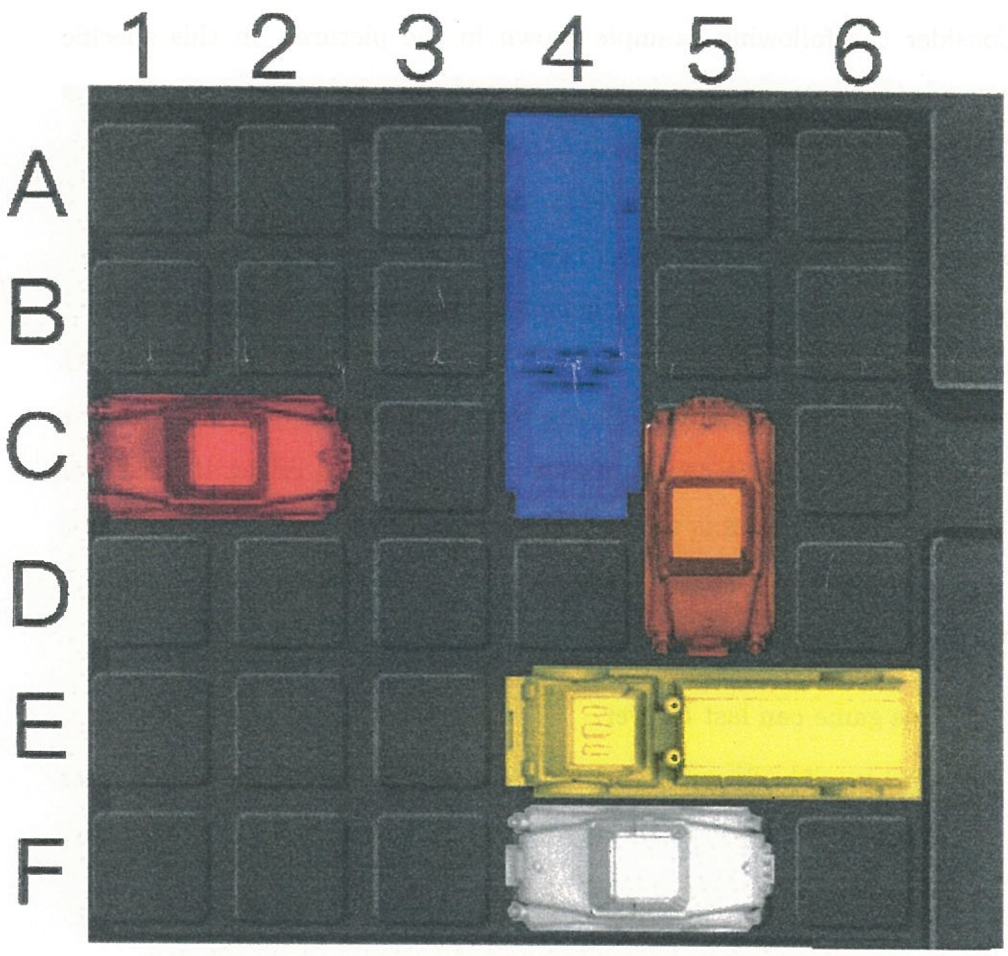
Multiple-answer questions. Choose correct answer(s). The number of correct answers for each question could be from 0 to 5. For each wrong answer in a question, you are deducted 4 points (from 10 points) until you get 0 point in that question. For instance, suppose the correct answers are abc, but your answers are acd, then you get a right, miss b, get c right, wrongly include d, correctly miss e. Thus for this question there are two wrong answers (miss b and wrongly include d), hence you get 10-4-4=2 points. If you leave this question blank, you wrongly miss abc and correctly miss de, hence you get 0 point because 10-4-4-4=-2<0.



見背面

※注意：每題10分，每答錯一個答案扣4分，倒扣到該題0分。
請用2B鉛筆作答於答案卡，並先詳閱答案卡上之「畫記說明」。

1. Rush hour is a board game for a kid. There are vehicles parking on a 6*6 surface squares. Among them is a red vehicle. There is an exit hole and the kid's goal is to move the red vehicle through the exit hole of the board by moving the other vehicles out of its way. The game ends when the kid achieves the goal. Each vehicle is one square wide and is either two squares long or three squares long. Each square is labeled by an alphabet and a number. For instance, the northwestern corner is labeled as A1. The exit is next to C6.

   Consider the following example shown in the picture. In this specific example there are five vehicles on the board. The red vehicle is on squares C1C2. Other vehicles are blue (on A4B4C4), orange (on C5D5), yellow (on E4E5E6) and white (on F4F5). Vehicles can only move forward or backward on the surface squares. They cannot move sideways. Hence, for instance, the blue vehicle, as it is facing down, can only move on column 4. Similarly, the orange vehicle can only move on column 5, the white vehicle can only move on row F, the yellow vehicle can only move on row E and the red vehicle can only move on row C. No lifting the vehicles off the surface squares is allowed. Two vehicles cannot occupy the same space. Apply what you have learned from game theory to this, you will conclude

   (a) This game can last forever.
   (b) The idea of backward induction suggests that during the process that the red vehicle passes through the exit, the yellow vehicle must have slid towards the left at least once.
   (c) In equilibrium, the red vehicle does not pass through the exit.
   (d) The idea of backward induction suggests that the orange vehicle must move to A5B5.
   (e) In equilibrium, there could be a vehicle which never moves.

2. Continue from above.

接次頁

(a) In a general game, increasing the number of vehicles makes the red vehicle pass through the exit less likely in equilibrium.

(b) In a general game, the red vehicle passes through the exit only when the number of vehicles is odd.

(c) To make the exemplar game shown in the picture more fun, it is now played with two kids R and B taking turns. R wins if the red vehicle passes through the exit, and B wins if he blocks so the red vehicle does not pass through the exit. The equilibrium outcome depends on whether R starts first or not.

(d) To make the exemplar game shown in the picture more fun, it is played with two kids R and B taking turns. R wins if the red vehicle passes through the exit, and B wins if he blocks so the red vehicle does not pass through the exit. In equilibrium, R wins when B starts first. Hence there is a second mover advantage.

(e) To make the exemplar game shown in the picture even more fun, it is played with three kids R1, R2 and B taking turns. R1 and R2 win if the red vehicle passes through the exit, and B wins if he blocks so the red vehicle does not pass through the exit. The equilibrium outcome, specifically on whether the red vehicle passes through the exit, is different from the equilibrium outcome in the question above where only a kid plays the exemplar game.

3. An ancient figure named Kong Rong is famous for not picking the biggest pear. A modern figure, Rong Kong (RK hereafter), decides to follow suit. RK has a brother, BR. They have identical tastes: they both prefer more to less.

However, RK learns from Kong Rong but BR does not. So when RK picks first and BR picks second, RK deliberately chooses his second favorite to leave the first favorite to BR. On the other hand, if BR has picked before RK, RK certainly chooses his most favorite from the remaining.

見背面

(a) Facing a big, a medium and a small pear, if RK picks first and BR picks second, RK will choose the small pear.

(b) Facing a medium and a small pear, if BR picks first and RK picks second, RK will choose the small pear.

(c) Given enough observations, an outside observer who only observes RK's choice and the choice set when RK chooses will conclude RK's behavior satisfies the axiom of revealed preference.

(d) Given enough observations, an outside observer who only observes RK's choice and the choice set when RK chooses will conclude RK's behavior violates the axiom of revealed preference.

(e) This year RK goes to extremes. No matter whether BR picks before or after him, RK deliberately chooses his second favorite when there are at least two different alternatives. Because RK always chooses his second favorite whenever possible, given enough observations, an outside observer who only observes RK's choice this year and the choice set when RK chooses will conclude RK's behavior satisfies the axiom of revealed preference.

4. We examine two events In Africa in this question, one on drought insurance and the other on human immunodeficiency viruses (HIV) testing.

Insurance: Crop farmers' fields are mostly rain-fed. Hence, insuring against drought is important. Traditional crop-insurance assesses farmers' losses due to a drought. And then farmers receive a payout. In recent years, a new kind of crop-insurance pays out automatically if a rainfall index, as estimated based on satellite monitoring of clouds, drops below a certain threshold.

HIV testing: HIV status is an important partner attribute where the prevalence is relatively high. However, it is hard to observe whether a potential partner is HIV-positive or -negative. Before, HIV testing is almost impossible because the cost is too high. A recent health intervention offers

接次頁

HIV test which is free and on-site, greatly reducing the cost of such test.

(a) This new type of insurance corrupts farmers' incentive to work hard because after they purchase the insurance, they will not suffer the loss of a drought.

(b) Because farmers cannot control the rain, there is less moral hazard of the new kind of insurance. That is, changes in farmers' behavior cannot make a payout more likely.

(c) The new insurance scheme could go wrong because monitoring clouds may not predict the subsequent rainfall perfectly.

(d) The HIV-negative people happily take the free test, to signal their health status. Hence, refusing to be tested sends a signal of the HIV-positive status.

(e) The HIV-positive group may be adversely affected by the intervention. Whether the welfare of all improves by the intervention depends on the proportion of the HIV-positive group.

5. Conspicuous consumption is the spending of money on luxury goods to publicly display the wealth of the buyer. Terry is wealthy. His consumption on sports car has this element of conspicuous consumption. When the relative price of the car is higher, he likes the car better. He consumes sports car and slippers. Because slippers are worn at home, they do not have this display-of-wealth function at all.

(a) Terry's demand of sports car may be upward-sloping.

(b) The sports car must be an inferior good to Terry.

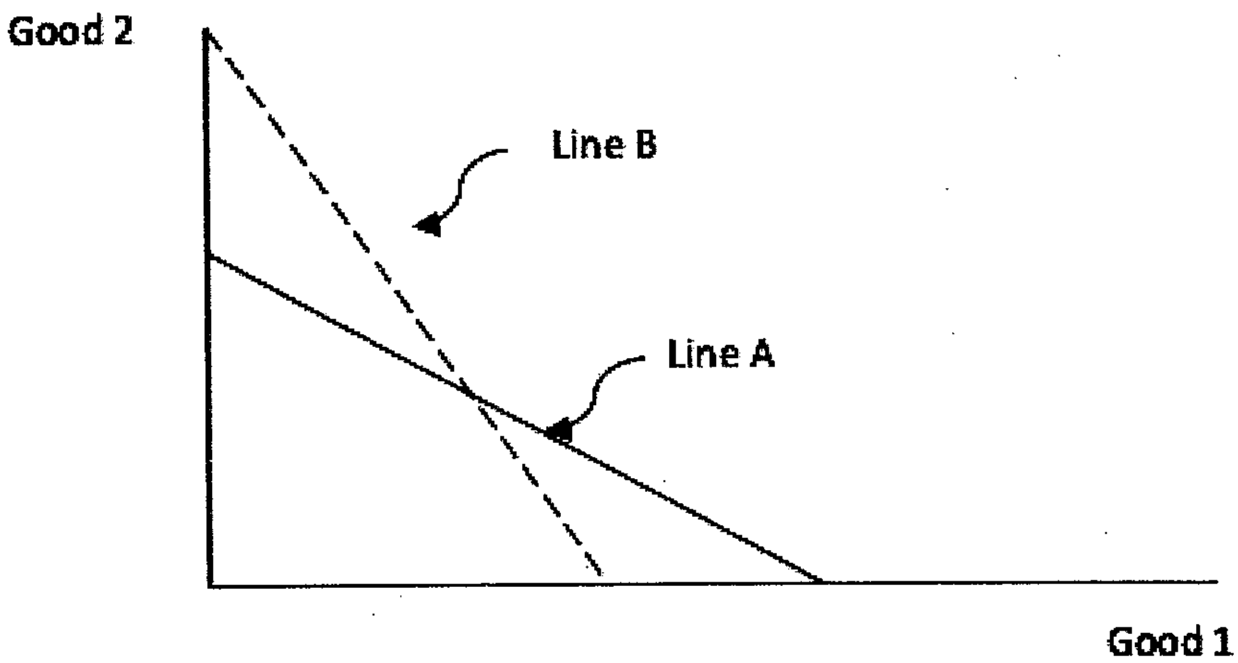
(c) If the price of the sports car goes up, the change in the demand of the sports car due to the substitution effect could be nonnegative.

(d) Taxing the sports car makes them more expensive. Therefore, the consumption becomes even more conspicuous. Hence, taxing could not make Terry worse off.

(e) Conspicuous consumption is more commonplace, unlike Giffen goods which are elusive and difficult to identify.

見背面

6. This graph shows a change in a consumer's budget line from line A to line B (from the solid line to the dashed line).

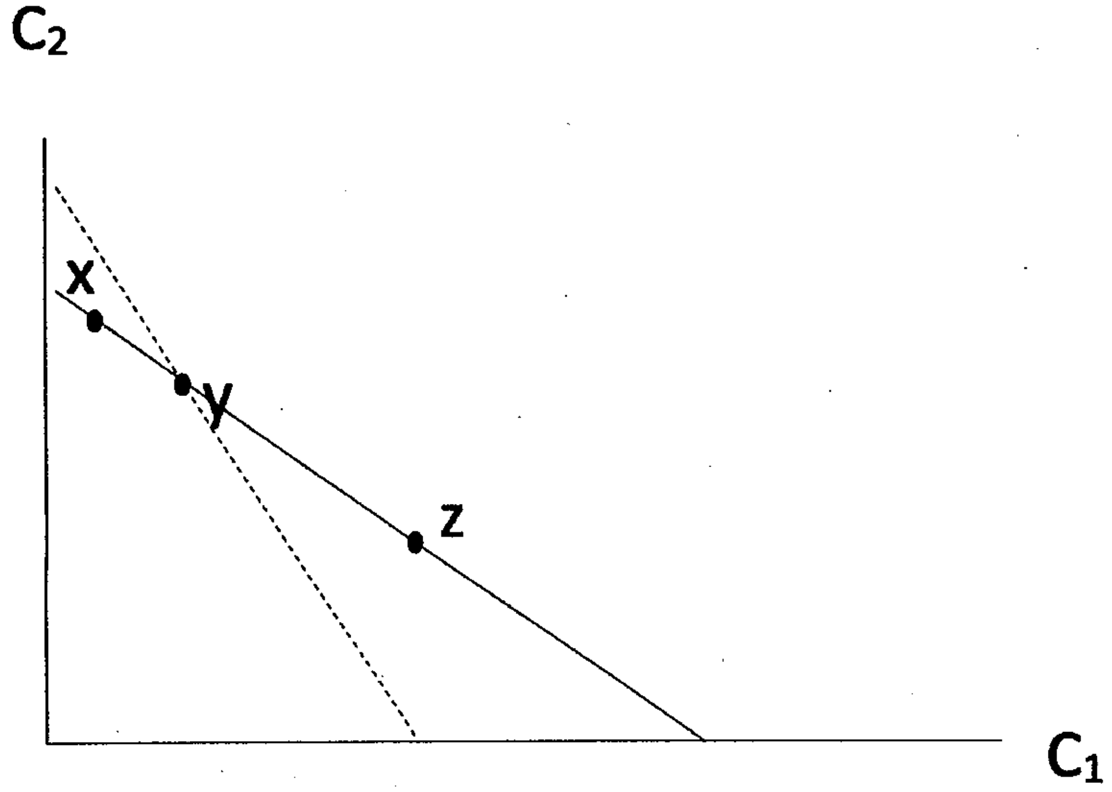


Which could explain this change in the budget line?

(a) Income has decreased, p_1 is unchanged, and p_2 has fallen.
(b) Income has increased, p_1 has fallen, and p_2 is unchanged.
(c) Income has increased, p_1 is unchanged, and p_2 has increased.
(d) Income is unchanged, p_1 has increased, and p_2 has fallen.
(e) Income is unchanged, p_1 has increased, and p_2 is unchanged.

接次頁

7. Amy faces an intertemporal budget constraint: $c_1 + \left(\frac{1+\pi}{1+i}\right) c_2 = M_1 + \left(\frac{1}{1+i}\right) M_2$, where c_1 is "consumption this period", c_2 is "consumption next period", M_1 is "income this period", M_2 is "income next period", π is an "inflation rate", and i is interest rate (which we assume to be the same for savers and borrowers). Amy has a well-behaved preference. Suppose the interest rate changes and Amy's intertemporal budget line changes from the solid line to the dashed line.



(a) Amy's optimal consumption bundle is always at point y.

(b) Suppose Amy's optimal consumption bundle was at point x before the interest rate changes, she definitely will consume more this period (i.e. c_1 increases) after the interest rate changes and Amy's intertemporal budget line changes from the solid line to the dashed line.

(c) Suppose Amy's optimal consumption bundle was at point x before the interest rate changes, she may consume less this period (i.e. c_1 decreases) after the interest rate changes and Amy's intertemporal budget line changes from the solid line to the dashed line. It is because the substitution effect may outweight the income effect.

(d) Suppose Amy's optimal consumption bundle was at point z before the interest rate changes, she definitely will consume more this period (i.e. c_1 increases) after the interest rate changes and Amy's intertemporal budget line changes from the solid line to the dashed line.

(e) Suppose Amy's optimal consumption bundle was at point z before the interest rate changes, she may consume less this period (i.e. c_1 decreases) after the interest rate changes and Amy's intertemporal budget line changes from the solid line to the dashed line. It is because the substitution effect may outweight the income effect.

8. The Independence Axiom says, if a consumer prefers lottery p to lottery q, then,

$$\text{for any other lottery r and number } 0 < \alpha \leq 1,$$
$$\text{they must prefer}$$
$$\alpha p + (1 - \alpha)r$$
$$\text{to}$$
$$\alpha q + (1 - \alpha)r.$$

Choose which situation(s) VIOLATE the independence axiom.

(a) A consumer is willingness to pay $800 to buy a lottery, in which there a $80% chance of winning $1,000.

(b) A consumer is not willingness to pay $800 to buy a lottery, in which there a $80% chance of winning $1,000.

(c) A consumer prefers lottery A to lottery B, in which lottery A is a $100% chance of getting $800, and lottery B is a $80% chance of getting $1,000. This consumer also prefers lottery C to lottery D, in which lottery C is a $25% chance of getting $800, and lottery D is a $20% chance of getting $1,000.

(d) A consumer prefers lottery A to lottery B, in which lottery A is a 100% chance of $1 million, and lottery B is a 10% chance of $5 million, a 89% chance of $1 million and a 1% chance of $0. This consumer also prefers lottery C to lottery D, in which lottery C is a 11% chance of $1 million, 89% chance of $0, and lottery D is 10% chance of $5 million and a 90% chance of $0.

(e) A consumer prefers lottery C to lottery D, in which lottery C is a $33% chance of getting $2500 and a a $66% chance of getting $2400 , and lottery D is a $100% chance of getting $2,400. This consumer also prefers lottery A to lottery B, in which lottery A is a $33% chance of getting $2500, and lottery B is a $34% chance of getting $2,400.

接次頁

9. Suppose there is an exchange economy with two individuals A and B and two periods "now" and "later". In each period there is only one good they can consume: chocolate. Let's define the amount of chocolate consumed by each consumer either now or later as (N_A, L_A) and (N_B, L_B). Consumers can't store chocolate from one period to another because it might get wasted. However, they can exchange chocolate within each period. For example, A might want to give 1 unit of chocolate to B now in exchange of 2 units of chocolates later. In such a case we can say that B is paying A an interest rate $r = 1$.

   (a) Suppose $(N_A^0, L_A^0) = (N_B^0, L_B^0) = (5,5)$, Consumer A gets pretty excited about chocolate the first time she sees it such that her preference can be represented by the following Cobb-Douglas utility function: $U_A = NL^{1/2}$. Consumer B is more patient and she is relatively indifferent between consuming more chocolate now or later. Her preference can be represented then by: $U_B = NL$. In this case, the equilibrium price is $r = \frac{2}{5}$.

   (b) Suppose $(N_A^0, L_A^0) = (10,0), and (N_B^0, L_B^0) = (0,10)$, Consumer A gets pretty excited about chocolate the first time she sees it such that her preference can be represented by the following Cobb-Douglas utility function: $U_A = NL^{1/2}$. Consumer B is more patient and she is relatively indifferent between consuming more chocolate now or later. Her preference can be represented then by: $U_B = NL$. In this case, the origin endowment point is pareto efficient.

   (c) Suppose $(N_A^0, L_A^0) = (N_B^0, L_B^0) = (5,5)$, Consumer A only cares about the total amount of chocolate she consumes. Her preference can be represented by the following utility function: $U^A = N + L$. Consumer B gets pretty excited about chocolate every time she sees it such that her preference can be represented by the following Cobb-Douglas utility function: $U_B = NL$. In this case, the equilibrium price is $r = 1$.

   (d) Suppose $(N_A^0, L_A^0) = (N_B^0, L_B^0) = (5,5)$, Consumer A's utility function is $U_A = \min(N_A, L_A)$, and consumer B's utility function is $U_B = \min(N_B, \frac{1}{2}L_B)$. One of the pareto efficient allocation is $(N_A, L_A) = (6,5)$. and $(N_B, L_B) = (4,5)$.

   (e) Suppose in this economy, there are 10 chocolates now and there are 10 chocolate later. Consumer A's utility function is $U_A = N_A + \frac{1}{2}L_A$, and consumer B's utility function is $U_B = N_B + \frac{1}{2}L_B$. The contract curve is all points in the edgeworth box.

見背面

10. Six communters need to commute from city W to city E every day. Each commuter drives his/her own car. There are two routes, one is the north route (road "$W \to N$" and then road "$N \to E$"), and the other is the south road (road "$W \to S$" and then road "$S \to E$"). Each commuter wants to minimize their travel time, which is an increasing function of the number of cars on that road. If x is the number of cars on a road, then the travel time for each of the four roads, in minutes, are as follows.
road "$W \to N$": $1 + 3x$
road "$N \to E$": $20 + x$
road "$W \to S$": $20 + x$
road "$S \to E$": $1 + 3x$

(a) Suppose there is no regulation. Each commuter can freely choose one of the two routes. In this case, at the equilibrium, the number of cars through the north route and the number of cars through the south route must be the same, the estimated travel time from the north route is 33 minutes.

(b) Suppose a social planner is interested in minimizing the total travel time. This social planner is going to impose a regulation based on the optimal solution. In this case, the estimated travel time is still the same as the equilibrium solution.

(c) There is a new highway connecting N and S, that is to say, there is a new road, road "$N \to S$". If x is the number of cars on this road, the travel time for this road is $7+x$. Suppose there is no regulation. Each commuter can freely choose one of the three routes,"$W \to N \to E$", "$W \to S \to E$", or "$W \to N \to S \to E$". At the new equilibrium, no one will use the new highway.

(d) There is a new highway connecting N and S, that is to say, there is a new road, road "$N \to S$". If x is the number of cars on this road, the travel time for this road is $7+x$. Suppose there is no regulation. Each commuter can freely choose one of the three routes,"$W \to N \to E$", "$W \to S \to E$", or "$W \to N \to S \to E$". At the new equilibrium, the estimated travel time is shorter than the estimated travel time at the old equilibrium when the high way, road "$N \to S$", is not built.

(e) There is a new highway connecting N and S, that is to say, there is a new road, road "$N \to S$". If x is the number of cars on this road, the travel time for this road is $7+x$. Suppose there is no regulation. Each commuter can freely choose one of the three routes,"$W \to N \to E$", "$W \to S \to E$", or "$W \to N \to S \to E$". Suppose a social planner is interested in minimizing the total travel time. This social planner is going to impose a regulation based on the new optimal solution (after the highway is built). In this case, the estimated travel time is the same as the new equilibrium solution when new highway is built.