B.E. International Program

Faculty of Economics, Thammasat University

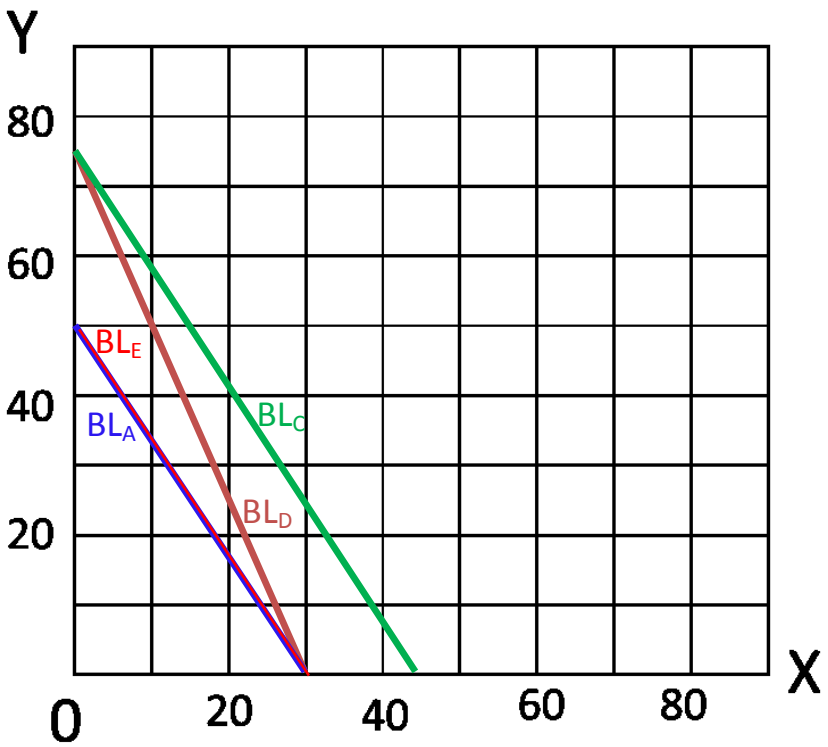
EE 211 Principle of Microeconomics

Semester 1/2017

Exercise 6 - Answers

(Theory of Consumer Behavior)

1. A consumer has a budget of $600 to spend on two commodities X ($20 per unit) and Y ($12 per unit).
   a. Draw the budget line for the consumption expenditures of these two commodities in the following figure. Label the budget line BL_A.



   b. Is the combination of 20 units of X and 20 units of Y attainable? Explain.

Not attainable because it lies outside the budget line.

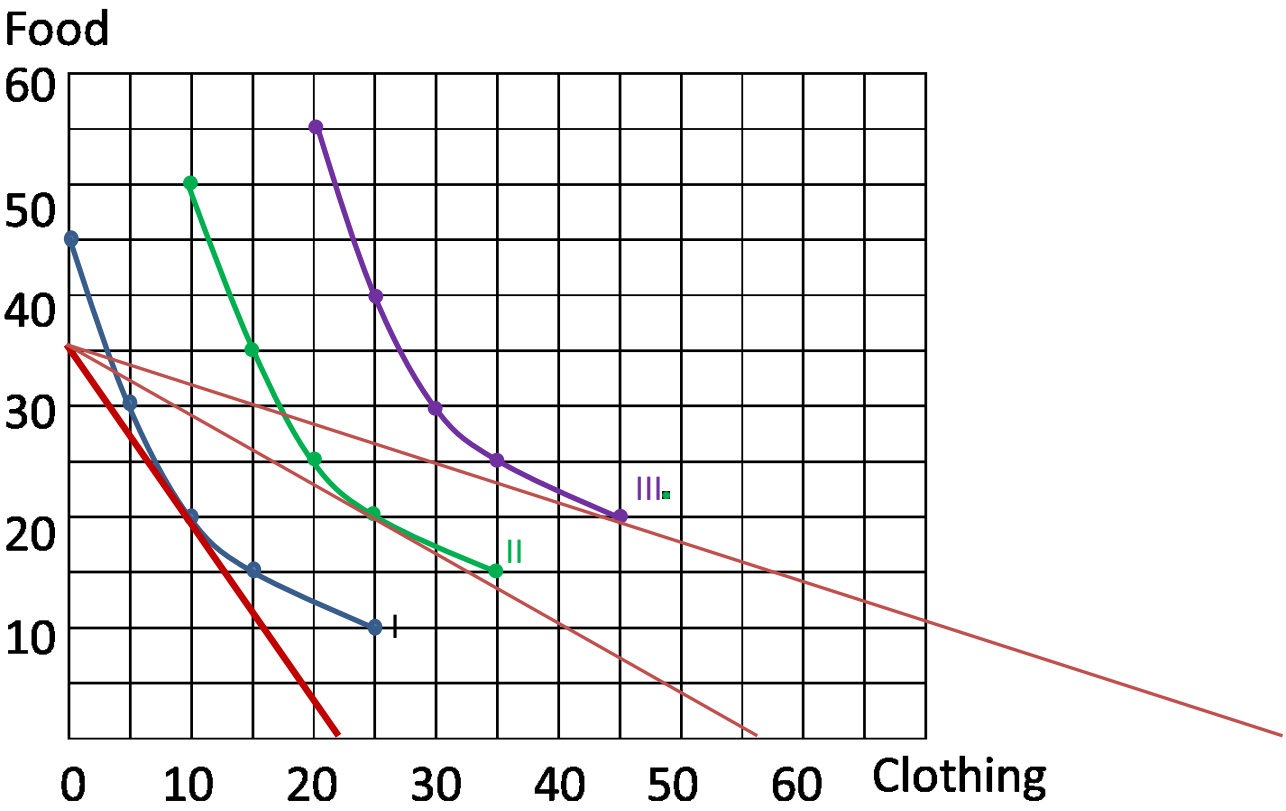
c. Suppose an increase in income allowed a 50 percent increase in the consumption expenditures. Graph the new budget and label it BL_C – assume prices are unchanged.
d. Suppose now that the price of X increases to $30 per unit, *ceteris paribus*. Draw the new budget line and label it BL_D.
e. Finally, suppose that the price of Y increases to $18 per unit. Draw the new budget line and label it BL_E. Compare BL_A and BL_E. Explain your findings.
BL_A and BL_E are identical because both prices and money income have changed in exactly the same proportion.

2.

a. The following table provides information on the quantities of food and clothing that are contained on indifference curves I, II, and III.

Units of food			Units of clothing		
I	**II**	**III**	**I**	**II**	**III**
45	50	55	0	10	20
30	35	40	5	15	25
20	25	30	10	20	30
15	20	25	15	25	35
10	15	20	25	35	45

i. Graph indifference curve I, II, and II on the grid below.



ii. Draw a budget line on the graph that represents a budget constraint of $350, and food and clothing prices are $10 and $15, respectively.

iii. Given (i) and (ii), what combination of food and clothing will maximize consumer satisfaction? Explain.
F = 20, C = 10. Given the budget constraint, Curve I is the highest indifference curve attainable.

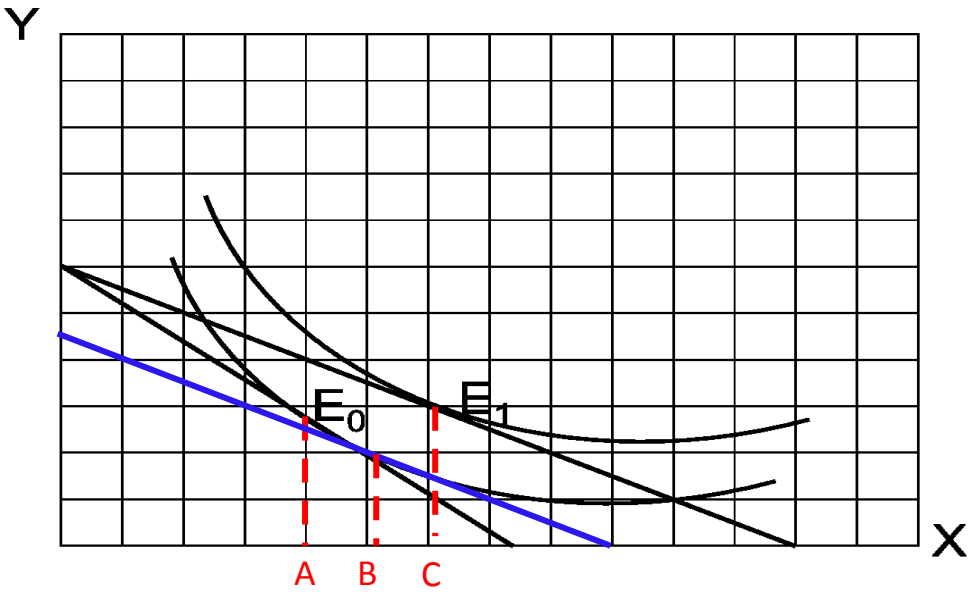
b. Extend the analysis and use the same graph to show the derivation of a demand curve for clothing by proceeding as follows (assume that "food" stands for "everything consumed except clothing").

i. Change the price of clothing so that a budget line with the same food intercept (35) is tangent to each of the indifference curve I, II, and III. Extend the X axis as necessary.
The X –intercept for budget lines tangent to indifference curves I, II, and II are approximately, 23.3, 58, 105, respectively.
The prices of clothing represented by the budget lines are approximately _$15_, __$6_, and __$3.33_, respectively.

ii. Draw the price-consumption line on the graph.
Connect points of tangency.

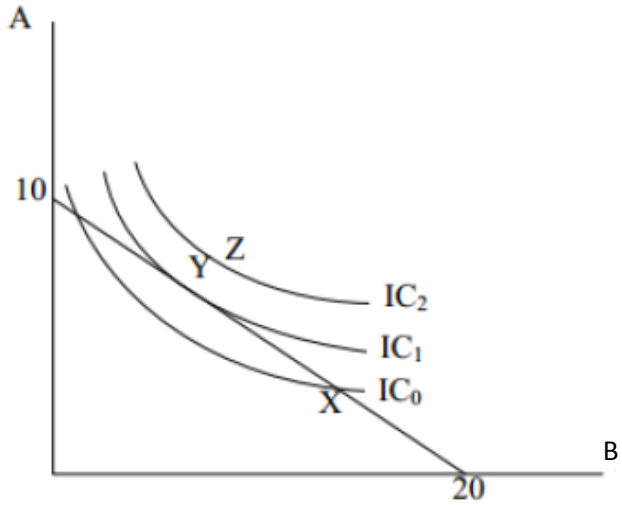
iii. Based on the information on the price-consumption line, derive a demand curve for clothing.
Plot the corresponding price-quantity combinations on a graph with quantity demanded on the X axis.

3. In the following figure, a household is shown to move from equilibirum E0 to a new equilibrium E1 in response to a decline in the price of commodity X.



a. Illustrate on the graph the size of the substitution effect.
AB is the substitution effect.
b. Illustrate on the graph the size of the income effect.
BC is the substitution effect.
c. Is commodity X an inferior good? Explain.
No. It X were an inferior good, there would have to be a negative income effect.

4. Consider the following figure.



a. If P_A = 15 baht, compute the total budget.
Income = 150 baht.

b. Based on the information in part (a), what is P_B?
P_B = 7.5 baht.

c. Calculate the marginal rate of substitution (MRS) at Y. Explain its meaning.
At Y, MRS = 0.5. This means that, in order to maintain the same utility level on IC1, the consumer will give up 0.5 unit of good A to obtain 1 additional unit of B.

d. Explain why the consumer would not choose to consume at point X nor point Z.
At point X, the consumer is not choosing the highest indifference curve (which means higher utility level) for the given budget constraint.
At point X, it is unattainable.

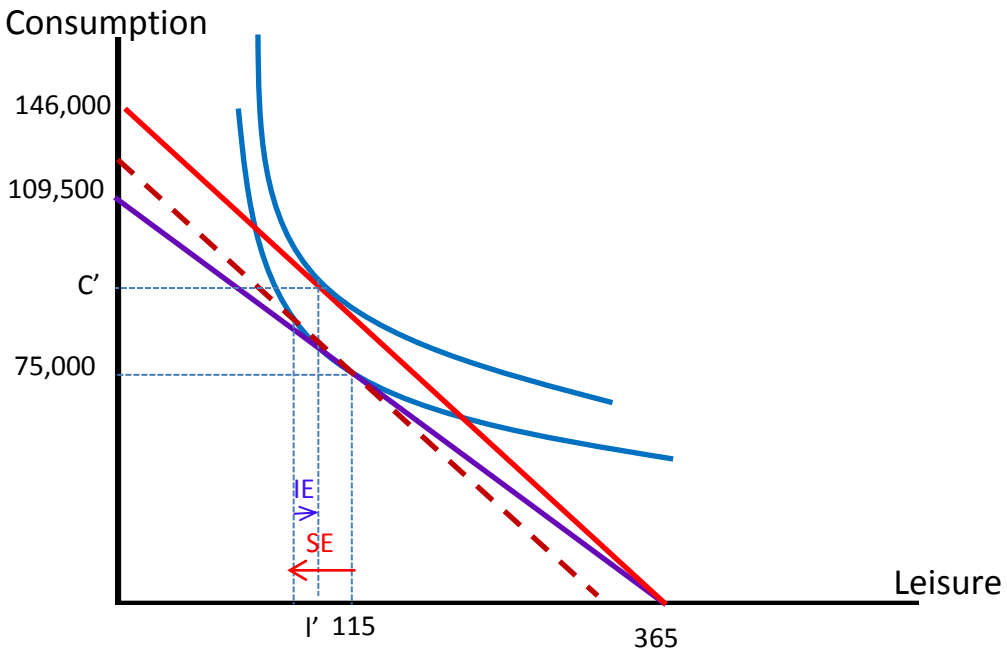
e. Suppose that P_A reduces by half and P_B increases twice as much, what would happen to MRS at the new equilibrium? Explain the economic meaning of this change.
MRS = $- P_B / P_A = -(15/7.5) = -2$. To maintain the same utility level, consumer will have to give up more of good A to obtain 1 additional unit of B since good B becomes relatively more expensive.

5. Suppose that a consumer faces a work-leisure trade-off decision. His daily wage rate is 300 baht, and the maximum number of days that he can work is 365 days. If he does not work, he will spend time on leisure.
   a. Draw a budget line on a diagram where the x-axis is the number of days of leisure, and the y-axis is total consumption (derived from his earning).

See below.

b. Suppose this consumer's optimal choice is to work for 250 days. Calculate his optimal consumption, and the MRS.
Optimal consumption = 300*250 = 75000 baht.
Optimal leisure = 365-250 = 115 days.
MRS = -w = -300. This MRS measures the marginal value of a day of leisure, in terms of (money worth of) consumption.

c. Suppose that his wage increases to 400 baht per day. Would this consumer work more or less? Fully explain the income and substitution effects and correctly label on the diagram.



If SE > IE, labor supply increases as wage rises. [The case drawn above.]

If SE< IE, labor supply decreases as wage rises. [Try yourself!]