

EE211 Assignment #2 (Section 2 Semester 2/2020)

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1. Belle is choosing ham (h) and cheese (c), which is assumed to be substitutable goods for her. Her total utility from each product is given in the table here.

Quantity	Total utility from ham (TU_h)	Total utility from cheese (TU_c)
1	15	12
2	26	21
3	35	27
4	41	32
5	45	35
6	48	37
7	49	38

Answer the following questions.

(a) If Belle has \$7 budget and both ham and cheese cost \$1 each, how many units of ham and cheese she should purchase to maximize her utility? Explain your method clearly.

Quantity	MU_h	MU_c	$\frac{MU_h}{P_h}$	$\frac{MU_c}{P_c}$	choice ham/cheese	remaining budget
1	15	12	15	12	15/12	7-1=6
2	11	9	11	9	11/12	6-1=5
3	9	6	9	6	11/9	5-1=4
4	6	5	6	5	9/9	4-1=3
5	4	3	4	3	9/6	3-1=2
6	3	2	3	2	6/6	2-1=1
7	1	1	1	1	4/6	1-1=0

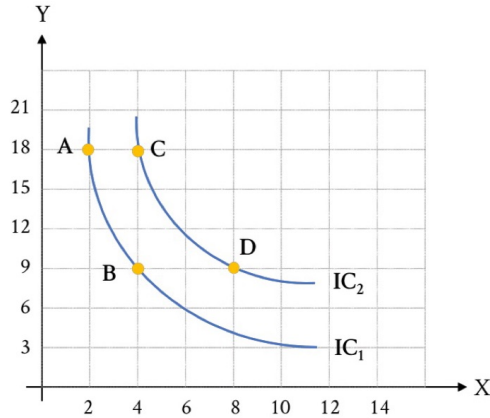
With 1 more unit that she will choose, it would provide her more net benefit, so she should buy in the amount which net benefit for each product equal to each other.

$\frac{MU_h}{P_h} = \frac{MU_c}{P_c}$ and that she can choose to buy 4 ham and 3 cheese to maximize her utility and use all the budget.

(b) Provide a clear explanation why her utility will not be maximized if the condition that you apply in part a. is not yet satisfied.

To maximize the utility, it should be where $MU = 0$ which is not presented in the table. Moreover, the budget would be insufficient.

2. A consumer finds that for him/her avocado (X) and nuts (Y) are substitutes. Assumed that this consumer yields 8 and 12 utils on IC_1 and IC_2 respectively, show your work and answer the following questions.



(a) Measured from point A to B, assumed P_y is 10 baht per unit, how much P_x must be to make you conclude that the consumer's equilibrium is on point B?

$$\begin{aligned} MRMS &= \left| \frac{\Delta Y}{\Delta X} \right| = \frac{P_x}{P_y} \\ \left| \frac{18-9}{2-4} \right| &= \frac{P_x}{10} \\ \frac{9}{2} &= \frac{P_x}{10} \Rightarrow P_x = \frac{90}{2} = 45 \text{ baht} \end{aligned}$$

(b) Measured from point A to B, assumed P_x is 180 baht per unit, how much budget does this consumer has to achieve the equilibrium on point B?

$$\begin{aligned} \text{b) } MRMS ; \quad \frac{9}{2} &= \frac{180}{P_y} \\ P_y &= 40 \end{aligned}$$

$$\begin{aligned} \bar{I} &= P_x \cdot x + P_y \cdot y \\ I &= 180 \cdot 4 + 40 \cdot 9 \\ I &= 720 + 360 \\ &= 1,080 \text{ baht} \end{aligned}$$

(c) Measured from point C to point D, how much is the average marginal utility per unit of avocado?

Consumer yields 12 utils on IC_2 ; $X = \text{avocado}$, $Y = \text{nut}$

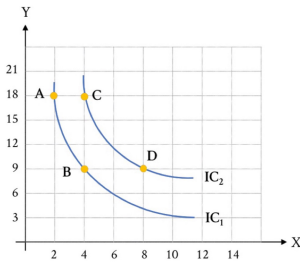
$$4x + 18y = 12 \quad (1)$$

$$8x + 9y = 12 \quad (2)$$

$$16x + 18x = 24 \quad (2 \times 2)$$

$$3 - 1; 12x = 12 \Rightarrow x = 1 = MU_x \text{ per Unit}$$

(d) Show that this consumer's utility received from consuming avocado is in accordance with the law of diminishing marginal utility, using any essential information from any point. (But highly recommend that you consider all the points)



$$IC_1: MRS_{xy}(B) = \frac{\Delta y}{\Delta x} = \left| \frac{18-9}{2-4} \right| = \frac{9}{2} = 4.5$$

$$MRS_{xy}(E) = \left| \frac{9-6}{4-6} \right| = \frac{3}{2} = 1.5$$

$$MRS_{xy}(F) = \left| \frac{6-3}{6-12} \right| = \frac{3}{6} = 0.5$$

At $A \rightarrow B$: willing to give up more y to gain a little amount of x
because MU_y is low and MU_x is high.

At $E \rightarrow F$: willing to give up only little y to gain more x
because MU_y is getting higher and MU_x is getting lower

$$MRS_{xy}(B) > MRS_{xy}(E) > MRS_{xy}(F)$$

$\Rightarrow$ The ratio is lower because MU_y is getting higher and MU_x is getting lower

$\therefore$ As the consumer give up fewer and fewer units of y to get the additional units of x because the MU_x is diminishing. Therefore the law of diminishing marginal utility is applied.