

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.

(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.

Solution

(1)

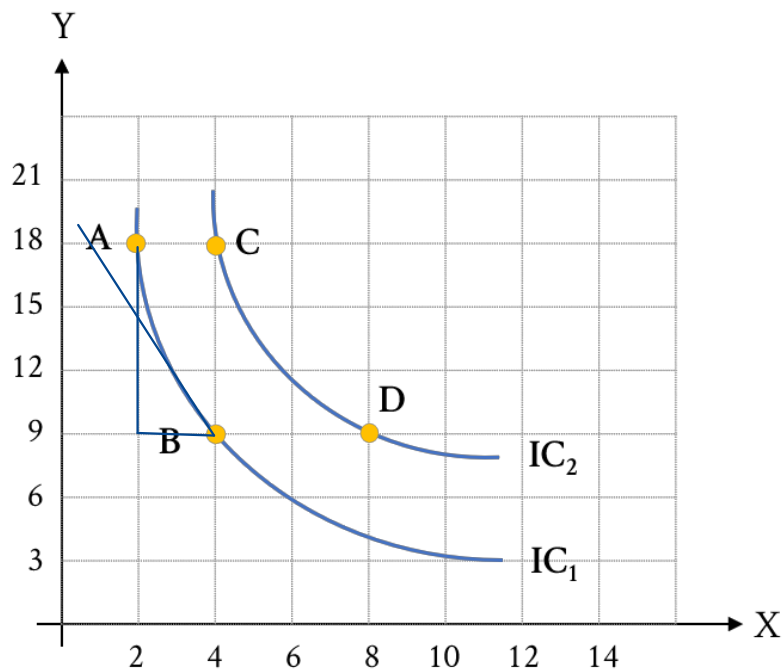
(a). let x be the units of ham
y be the units of cheese

budget	x, y	TU_x	TU_y	MU_x	MU_y	MU_x/P_x	MU_y/P_y	choice	remain budget
	1	15	12	15	12	$15/1=15$	$12/1=12$	x_1	6
	2	26	21	11	9	$11/1=11$	12	y_1	5
	3	35	27	9	6	11	9	x_2	4
7	4	41	32	6	5	9	9	y_2	3
	5	45	35	4	3	9	6	x_3	2
	6	48	37	3	2	6	6	y_3	1
	7	49	38	1	-19	6	5	x_4	0

Thus, To maximize her utility, Belle has to choose 4 units of ham and 3 units of cheese

(b). Her utility will not be maximized because law of diminishing Marginal utility for each product or service that consumer consuming the marginal utility for each one will diminishes. Therefore, in some points that consumer getting full even consume more it will not satisfied.

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 IC₁ and IC₂ 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?

(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?

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

(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)

Solution

2.

$$(a). MRS_{xy(a \rightarrow b)} = \frac{\Delta Y}{\Delta X} = \frac{18 - 9}{2 - 4} = \frac{9}{-2} = -4.5 \frac{Y}{X}$$

Since $P_Y = 10$ baht per unit $\Rightarrow P_X = 10 \times 4.5 = 45$ baht per unit (the consumer's equilibrium on point B).

$$(b). MRS_{xy(a \rightarrow b)} = -4.5 \frac{Y}{X} ; \text{ if } P_X = 180 \text{ baht per unit } \Rightarrow P_Y = \frac{180}{4.5} = 40 \text{ baht per unit}$$

$$\text{Equilibrium on point B: } (4, 9) \Rightarrow (4 \times 180) + (9 \times 40) = 1080 \text{ baht}$$

Therefore, the budget that the consumer has to achieve in order to get to equilibrium B is 1080 baht

(C.) From point C to D:

$$MRS_{C \rightarrow D} = \frac{\Delta Y}{\Delta X} = \frac{18 - 9}{4 - 8} = \frac{9}{-4} = -2.25$$

$\Rightarrow$ We sacrifice 9 unit of nuts to get 4 unit of avocado.

(d). Show that consumer's utility received from consuming is in accordance to the law of diminishing marginal utility:

$$|MRS_{a \rightarrow b}| = 4.5$$

$$|MRS_{c \rightarrow d}| = 2.25$$

As we can see that, MRS of avocado goes down, when consuming more and more avocado. (Law of diminishing marginal utility: $x^\uparrow$; MU_x)
