1.a)

I	h, c	$\frac{MU_h}{P_h}$	$\frac{MU_c}{P_c}$	choice	budget remain
7	1	~~15~~	12	h_1	6
	2	11	~~9~~	c_1	5
	3	~~9~~	6	h_2	4
	4	6	5	c_2	3
	5			h_3	2
	6			c_3	1
	7			h_4	0

∴ Belle should purchase 4 units of ham and 3 units of cheese to maximize her utility by comparing the net benefit for each choice that she has one at a time.

1.b) Her utility will not be maximized if she choose the choice with lower net benefit, while she can choose another choice with higher net benefit.

2.a) Point A→B : $MRS_{xy} = \frac{\Delta Y}{\Delta X} = \frac{9}{2} = \frac{4.5}{1}$ which means 1 unit of product X worth equally to 4.5 units of product y

If 1 unit of y cost 10 baht, then 4.5 units of y cost $10 \cdot 4.5 = 45$ baht

∴ As 1 unit of product X worth equally to 4.5 units of product Y, then the price per 1 unit of X is 45 baht.

∴ To prove that consumer's equilibrium is on point B, MRS_{xy} and the relative price must be equal. $MRS_{xy} = \frac{9}{2}$, $\frac{P_x}{P_y} = \frac{45}{10} \rightarrow MRS_{xy} = \frac{P_x}{P_y}$

2.b) At the equilibrium on point B, $MRS_{xy} = \frac{P_x}{P_y}$.

Therefore, as $P_x = 140 \rightarrow \frac{9}{2} = \frac{140}{P_y} \rightarrow P_y = 40$.

As $I \geq P_x \cdot X + P_y \cdot y$, then at point B $\rightarrow I \geq 140 \cdot 4 + 40 \cdot 9$

$I \geq 1{,}080$.

∴ The budget that she has to acheive the equilibrium point is 1,080 baht.

2.c) the average marginal utility per unit of avocado from point C to point D

$\hookrightarrow MRS_{xy(D)} = \frac{\Delta Y}{\Delta X} = \frac{9-18}{8-4} = \frac{-9}{4} = -2.25$ #

2.d) On IC_1 : $|MRS_{xy(B)}| = \left|\frac{\Delta Y}{\Delta X}\right| = \frac{MU_x}{MU_y}$

$= \left|\frac{9-14}{4-2}\right| = \left|\frac{-9}{2}\right| = 4.5$

∴ At point B MU_x is 4.5 times to MU_y which means $MU_x > MU_y$.

It's accordance with the law of diminishing marginal utility because at point B he/she has 9 units of product y and 4 units of product X, so $MU_x > MU_y$.

On IC_2 : $|MRS_{xy(D)}| = \left|\frac{\Delta Y}{\Delta X}\right| = \frac{MU_x}{MU_y}$

$= \left|\frac{9-14}{8-4}\right| = \left|\frac{-9}{4}\right| = 2.25$

∴ At point D MU_x is 2.25 times to MU_y which means $MU_x > MU_y$.

It's accordance with the law of diminishing marginal utility because at point D he/she has 9 units of product y and 8 units of product X, so $MU_x > MU_y$.