

1. a)

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

with the budget constraint $I = 7$, she should purchase 4 and 3 units of ham and cheese respectively.

1. b) If the condition is not yet satisfied, the net benefits are not equal,

$\frac{MU_h}{P_h} \neq \frac{MU_c}{P_c}$, so her utility will not be maximized.

2. a) Consumer's Equilibrium Condition : $\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$
 from point A to B , $P_y = 10$

$$\left| \frac{\Delta y}{\Delta x} \right| = \frac{P_x}{P_y}$$

$$\left| \frac{18-9}{2-4} \right| = \frac{P_x}{10}$$

$$\frac{9}{2} \times 10 = P_x$$

$$45 = P_x$$

2. b) Consumer's Equilibrium Condition : $\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$
 from point A to B , $P_x = 180$

$$\left| \frac{\Delta y}{\Delta x} \right| = \frac{P_x}{P_y}$$

$$\left| \frac{18-9}{2-4} \right| = \frac{180}{P_y}$$

$$\frac{9}{2 \times 180} = P_y$$

$$0.025 = P_y$$

2. c) from point C to B , $\Delta x = 4 - 4 = 0$

B to D $\Delta x = 4 - 8 = -4$

\therefore from point C to D , the average marginal utility per unit of avocado (X) equals to $-\frac{4}{2} = -2$

2. d) from point A to B , slope $\cdot \frac{18-9}{2-4} = -4.5$

C to D , slope $\cdot \frac{18-9}{4-8} = -2.25$

\therefore both lines have negative slope so it can be stated that marginal utility (MU_x) of avocado diminishes as we keep consuming avocados (X),