1.a)

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

Firstly, we need to find MU_h, MU_c to calculate the net benefit of these products. Then, we choose the product with the highest net benefit until we ran out of budget.

1.b) Not finding the net benefit will results in inefficiency, which leads to an unmaximized utility. And according to the Walras' law all budget has to be spent.

2.a) $|MRS_{xy(B)}| = \left|\frac{\Delta Y}{\Delta X}\right| = \left|\frac{9-18}{4-2}\right| = \left|-\frac{9}{2}\right| = \frac{MU_x}{MU_y}$

Consumer's equilibrium is $\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$, Therefore $\frac{9}{2} = \frac{P_x}{10}$

$P_x = 45$ #

2.b) $|MRS_{xy}(B)| = \left|\frac{-9}{2}\right| = \frac{MU_x}{MU_y}$

Consumer's eq : $\frac{9}{2} = \frac{180}{P_y}$

$\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$

$P_y = 40$

The consumer will buy 9 unit of y and 4 unit of x at B
Therefore, $P_y \cdot y = 40 \cdot 9 = 360$ baht adding with $P_x \cdot X = 180 \cdot 4 = 720$ baht is 1080 baht. The budget of 1080 baht is what the consumer need to achieve the equilibrium on point B.

2.c) $|MRS_{xy}(D)| = \left|\frac{\Delta Y}{\Delta X}\right| = \left|\frac{9-18}{8-4}\right| = \left|-\frac{9}{4}\right| = \frac{MU_x}{MU_y}$

From C→B $= \frac{\Delta TU}{\Delta Y} = \frac{8-12}{9-18} = \frac{-4}{-9} = \frac{4}{9} = MU_y$

$\frac{MU_x}{MU_y} = \frac{9}{4} \Rightarrow \frac{MU_x}{4/9} = \frac{9}{4} \Rightarrow MU_x = 1$ #

2.d) From point C to D the curve start to get more flat, it implies that after consuming more of X, the consumer starts to prefer y more than X as the amount of y to substitute 1 unit of x is getting lesser. Thereby, the marginal utility of x is lesser while consuming more of x as according to the law of diminishing marginal utility.