Assignment 1

Assigned on Feb 17th, 2022. To be submitted on Feb 26th, 2022 before midnight

---

Instructions

(1) Please read the instruction carefully. Also take this habit with you into the exam room.
(2) Please read each question carefully and answer the questions straightforwardly. Always provide economic reasons at lease a paragraph for your analysis, or a graph when necessary, even when the question does not indicate so.
(3) Handing and submitting assignments are only available via BE Moodle.

Answering the questions and preparing answer sheets

(1) Answers are to be handwritten, in either digital or analog form, in a blank canvas or any clean paper. Make sure that your handwriting is clearly visible and readable.
(2) There is no need to rewrite the question. Just indicate the question number clearly for each of the answer, such as 1.a).
(3) When done, for the digital case, collage all the pages into a single PDF file. For those who write on sheets of paper, take photo of all pages then convert all of them into a single PDF file as well.
(4) Name your PDF file as StudentID_YourNickname, such as 640123456_Bo.

Submitting your answers

(1) Make sure your file does not exceed 10MB. This is the maximum file size for BE Moodle upload.
(2) Login to BE Moodle, head into the course, then the assignment topic.
(3) Choose your file to submit. Done. There will be timestamp for your upload date and time, so please make sure to not submit later than that.

1. A human civilization finds a new wood source of total 120 units. Wood can either be used to produce spear or bow for hunting. A wood master then calculates that in order to produce a spear, it takes 4 units of wood while 3 units for a bow. Answer the following questions.

1.a) Assumed that the opportunity cost of using this 120 units of wood to produce the products is constant, draw a production possibility curve (PPC), displaying quantity of spear on the vertical axis and quantity of bow on the horizontal axis, and indicate all the essential details in the graph and explain.

1.b) How much is the opportunity cost for a spear, in terms of bow? Show how you calculate this figure.

1.c) With this newly found resource, is it possible for this civilization to produce 20 spears and 12 bows? If it is, is this option efficient? Display this option on a graph from (a) and explain.

1.d) If a new method of making bow is discovered and requires only 1.5 units of wood for each bow, how does it affect the PPC and the opportunity cost for a spear? Illustrate the change and explain.

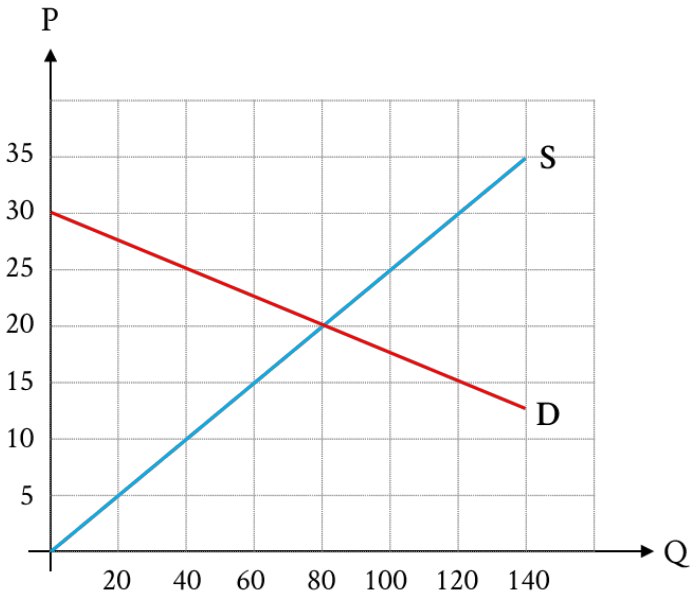
2. Few years ago, the MRT Purple Line electrical train opened to the public but with unexpected low ridership, the operator of MRT decided to lower the fare from 42 to 29 baht per trip. As a result, the number of passengers increased from 20,000 to 21,000 commuters.

2.a) What is the price elasticity of demand for MRT Purple Line? Show your work.

2.b) If the MRT operator decides to reduce the fare even further from 29 to 15 baht per trip. Do you think this price-reduction strategy will help increasing total revenue of MRT Purple Line? Give a clear explanation with support of a diagram.

.

3. Assumed that a headphones market is perfectly competitive, demand and supply for headphones are illustrated in the graph below. Answer the following questions.



3.a) Calculate price elasticity of demand and price elasticity of supply at the equilibrium price.

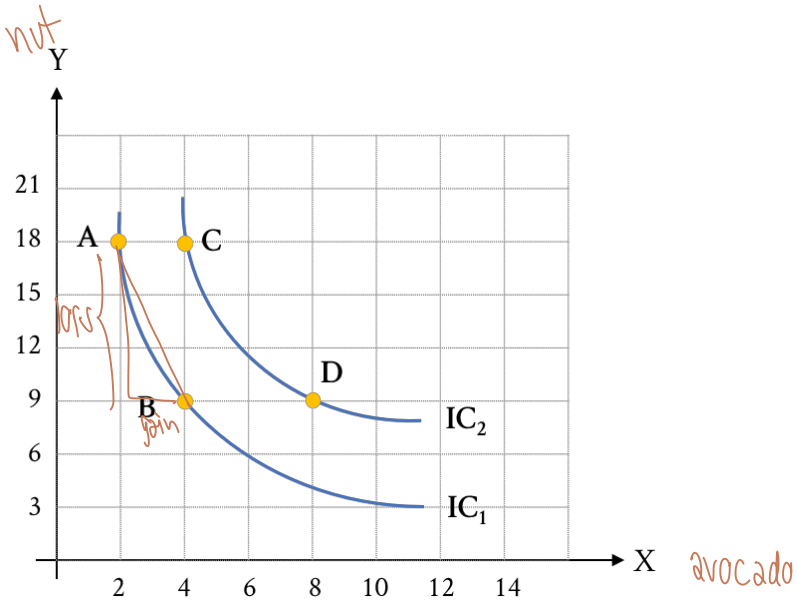
3.b) Calculate both consumer and producer surplus at the socially optimum price and quantity.

3.c) Now supposed that all the producers collude and become a monopoly, they can charge the price at $25. Consequently, total quantity in this headphones market becomes 40 pairs. Discuss the change in both consumer surplus and producer surplus.

3.d) Is there any deadweight loss due to the collusion? If there is, how much is it?

a.) $\frac{P}{Q} \times \frac{\Delta Q}{\Delta P} = \frac{20}{80} \times \frac{80}{10} = 2$

4. 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.



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

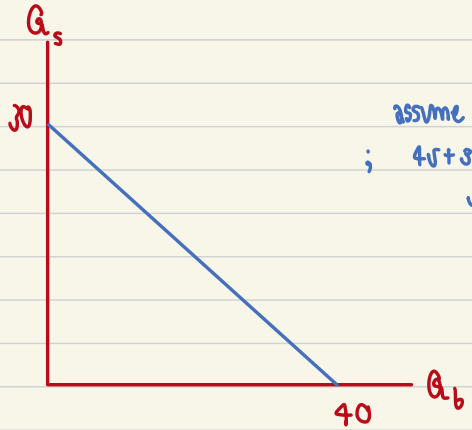
4.b) Measured from point A to B, assumed Px is 180 baht per unit, how much budget does this consumer has to achieve the equilibrium on point B?

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

4.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)

****

① a.)



assume s = spear, b = bow

$4s + 3.5b = 120$

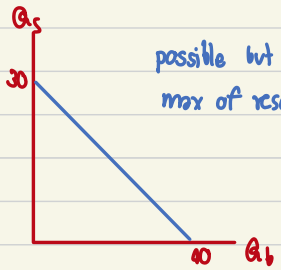
$s = \frac{-3.5b + 120}{4}$

b) Opportunity cost for spear : $\frac{d\,Q_b}{d\,Q_s} = -\frac{40}{30} = -\frac{4}{3} \approx -1.33\ldots$

$\therefore$ if spear ↑ 1 , we will lost $\frac{4}{3}$ bow

c.) when we produce 20 spear, we have 12 bows. that means $4(20) + 3(12) = 116$

$\therefore 116 < 120$



possible but inefficient because we produce less than max of resource.

d.) $4(s) + 1.5b = 120$

$4(0) + 1.5b = 120$

$b = 80$

- ppc shift outward for bow
- opp cost of spear : $\frac{\Delta B}{\Delta S} = \frac{80}{-30} = -2.67$
- since we can produce more bow. / Opp. cost of spear will increase

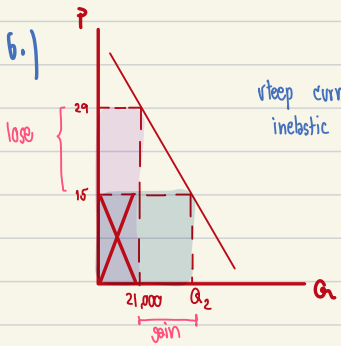
2.)

a.) price elasticity : $\frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1}{Q_1}$

$= \frac{21{,}000 - 20{,}000}{29 - 42} \times \frac{42}{20{,}000}$

$= |-0.1615| = 0.1615 \quad : \quad |\varepsilon < 1| = \text{Inelastic demand}$

b.)



steep curve is due to inelastic demand

This graph is inelastic demand, It should not reducing the price because if you want to increase TR, you should to increase Price (P↑) for decrease Quantity (Q↓) that equal to TR increase.

∴ If MRT purple line decrease price from 29 to 15, the total revenue will not increase

3.) a.) price elastic of demand

$$: E_d = \frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1}{Q_1}$$

$$= \frac{120 - 80}{15 - 20} \times \frac{20}{80}$$

$$= -2$$

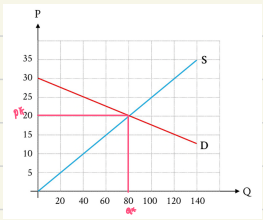
price elastic of supply

$$: E_s = \frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1}{Q_1}$$

$$= \frac{120 - 80}{30 - 20} \times \frac{20}{80}$$

$$= 1$$

b.)



consumer surplus $= \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times 80 \times 10$

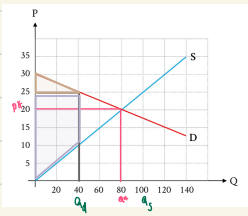
$= 400$ #

producer surplus $= \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times 80 \times 20$

$= 800$ #

c.)



At the first consumer has area = 400, but the price will increase that mean area of consumer surplus decrease to 100. Moreover producer surplus has area around 800, thus when price increase, and quantity will decrease area of PS will be the same that is 800

∴ In this case, when Price↓, Quantity↓ CS and PS will decrease too

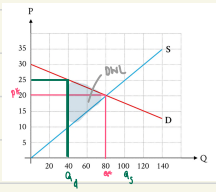
consumer surplus $= \frac{1}{2} \times 80 \times 5$

$= 100$

producer surplus $= \frac{1}{2} \times 20 \times 40$

$= 800$

d.)



yes, when price increas quantity will decrease that caused happen deadweight loss.

Deadweight loss $= \frac{1}{2} \times 15 \times 20$

$= 300$

4.)

a.) Consumers' equilibrium : $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$

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

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

$45 = P_x$

b.) Find P_y : $-\frac{MU_x}{MU_y} = -\frac{P_x}{P_y}$

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

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

$P_y = 40$

$I = 180(x) + 40(y)$

$I = 180(4) + 40(9)$

$I = 1080$ #

c.) $|MRS_{xy}| = \left|\frac{\Delta y}{\Delta x}\right| = \left|\frac{9-18}{8-4}\right| = \left|\frac{-9}{4}\right| = \frac{9}{4} = \frac{MU_x}{MU_y} \rightarrow MU_y = \frac{4}{9} MU_x$

at point D (8,9) $TU = 12 = MU_x \cdot X + MU_y \cdot Y$

$12 = MU_x \cdot 8 + \frac{4}{9} MU_x \cdot 9$

$12 = 12 MU_x \rightarrow MU_x = 1$

d.) On IC_1 : from A → B $\left(\frac{\Delta y}{\Delta x} = \frac{-9}{2}\right)$

consumer gain 2 avocados but give up 9 nut

On IC_2 : from C → D $\left(\frac{\Delta y}{\Delta x} = \frac{-9}{4}\right)$

consumer gain 4 avocados but give up 9 nut

∴ Law of diminishing marginal utility, MU will decrease when you want to keep consuming product because MU of IC_1 = MU of IC_2