Assignment 1

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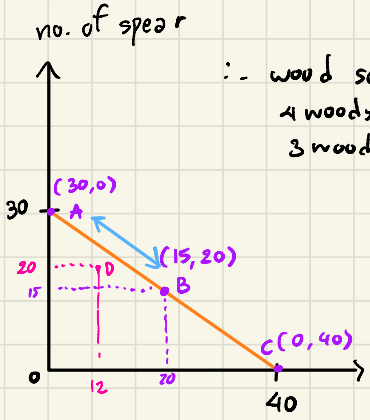
(1) 1.a)



∴ wood source = 120 units
4 woods : 1 spear
3 woods : 1 bow

- At point A, B, C
  We use all of the resources but t different amount of products.
- At point D
  We didn't use all of the resources. So, we have some resources left.
- To move B to A & A to B
  If we move B to A we will lose 20 bow and gained 15 spear.
  If we move A to B we will lose 15 spear and gained 20 bow.

1.b) opportunity cost for a spear, in term of bow

gained 15 spear : lose 20 bow

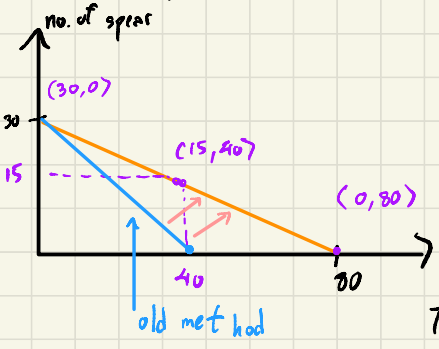
1 spear : $\frac{20}{15}$ bow

1 spear : 1.33 bow

1.C) It is possible to produce 20 spears and 12 bows but this option is not efficient because there will be resources left.

1. d) if 1.5 woods : 1 spear

120 woods
1.5 woods: 1 bow
3 woods : 1 Spear



The opportunity cost will be
1 spear : $\frac{40}{15}$ bow
= 2.6667 bow
→ The amount of bow that can be produce will be increase.
The PPC line is tilted counter-clockwise
The opportunity cost of bow will increase to 2.66

(2)

2.a) Price elasticity of demand for MRT Purple Line?

$$\varepsilon^d = \frac{Q_1 - Q_0}{P_1 - P_0} \times \frac{P_0}{Q_0}$$

$$= \frac{21000 - 20000}{29 - 42} \times \frac{12}{20000}$$

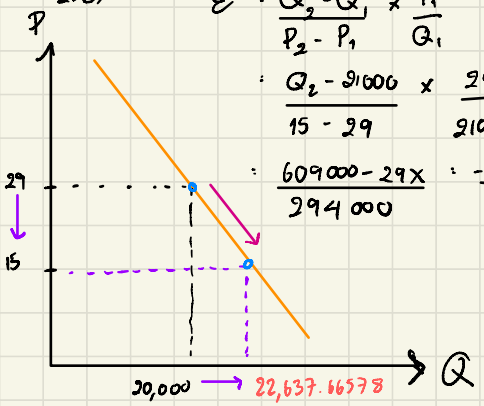
$$= \frac{-1000}{13} \times \frac{42}{20000}$$

$$= -\frac{21}{130} = -0.161538 \approx -0.162$$

$$\varepsilon^d = \frac{\%\Delta Q^d}{\%\Delta P} = -0.162$$

→ when price increase by 1%
↳ Q^d decrease by 0.162%.

2.b)



$$\varepsilon^d = \frac{Q_2 - Q_1}{P_2 - P_1} \times \frac{P_1}{Q_1} = \frac{-21}{130}$$

$$= \frac{Q_2 - 21000}{15 - 29} \times \frac{29}{21000} = -\frac{21}{130}$$

$$= \frac{609000 - 29X}{294000} = -\frac{21}{130}$$

$$= \frac{9534400}{377}$$

$$\approx 22637.66578$$

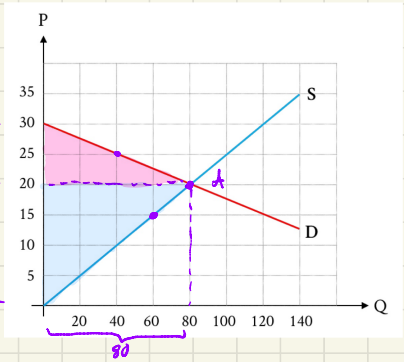
→ Price-reduction help increasing total revenue or not?

total revenue : $P \times Q$

before	After
$P_1 \times Q_1$	$P_2 \times Q_2$
$= 29 \times 21000$	$= 15 \times 22637.66578$
$= 609,000$	$= 339564.9867$

As the information beside, You can see that the Q_d is increasing due to the Price-reduction. But, the total revenue is decreasing. In conclusion, reducing price doesn't help total revenue to increase.

3)



3.a)

$$E^d = \frac{Q_1 - Q_0}{P_1 - P_0} \times \frac{P_0}{Q_0}$$

$$= \frac{80 - 40}{20 - 25} \times \frac{25}{40}$$

$$= \frac{40}{-5} \times \frac{25}{40}$$

$$= -5$$

$$E^s = \frac{(Q_1 - Q_0)/Q_0}{(P_1 - P_0)/P_0}$$

$$= \frac{\frac{80 - 60}{60}}{\frac{20 - 15}{15}} = \frac{\frac{20}{60}}{\frac{5}{15}}$$

$$= 1$$

3.b)

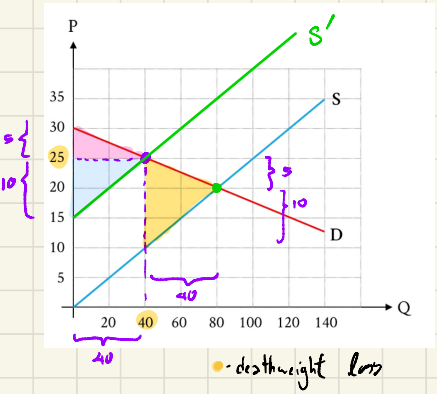
$$CS = \frac{1}{2} \times 80 \times 10$$

$$= 400$$

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

$$= 800$$

3.c)



→ Due to the increase in price, Producers can sell less.
In conclusion, the consumer surplus and producer surplus will be smaller.

- Consumer surplus

$$CS_{new} = \frac{1}{2} \times 40 \times 5$$

$$= 100$$

- producer surplus

$$PS = \frac{1}{2} \times 40 \times 10$$

$$= 200$$

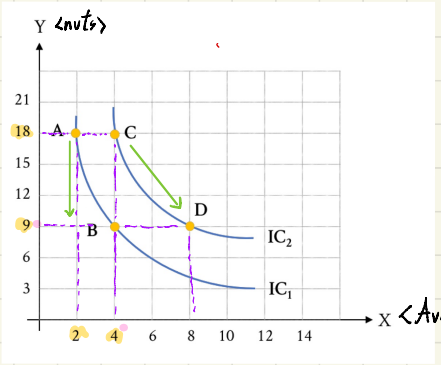
3.d) there is a deathweight loss →

$$= \left(\frac{1}{2} \times 40 \times 5\right) + \left(\frac{1}{2} \times 40 \times 10\right)$$

$$= 100 + 200$$

$$= 300 \#$$

(4)



4. a) A to B, $P_y = 10$

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

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

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

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

$P_x = 45$ #

4. b) A to B, $P_x = 180$

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

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

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

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

$P_y = 40$ #

budget?

→ $I = P_x X + P_y Y$

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

$= 720 + 360$

$= 1080$

4. c) C to D, avocado's average marginal utility?

C to D → consume less 9 nuts, consume more 4 acocado.

$$\frac{MU_x}{MU_y} = \left|\frac{\Delta y}{\Delta x}\right| = \left|\frac{18-9}{4-8}\right| = \left|-\frac{9}{4}\right| = 2.25$$

$$\left|MRS_{xy}(B)\right| = \left|\frac{\Delta y}{\Delta x}\right| = \left|\frac{9-18}{4-2}\right| = \left|\frac{-9}{2}\right| = 4.5$$

$$\left|MRS_{xy}(D)\right| = \left|\frac{\Delta y}{\Delta x}\right| = \left|\frac{9-18}{8-4}\right| = \left|-\frac{9}{4}\right| = 2.25$$

4. d) According to the law of diminishing utility, MU decrease as the quantity of avocado consumed increases. Based on the diagram, point A on IC_1 shows a small value of X (high MU_x) and as the value of X increase, MU_x decreases, as in point C.