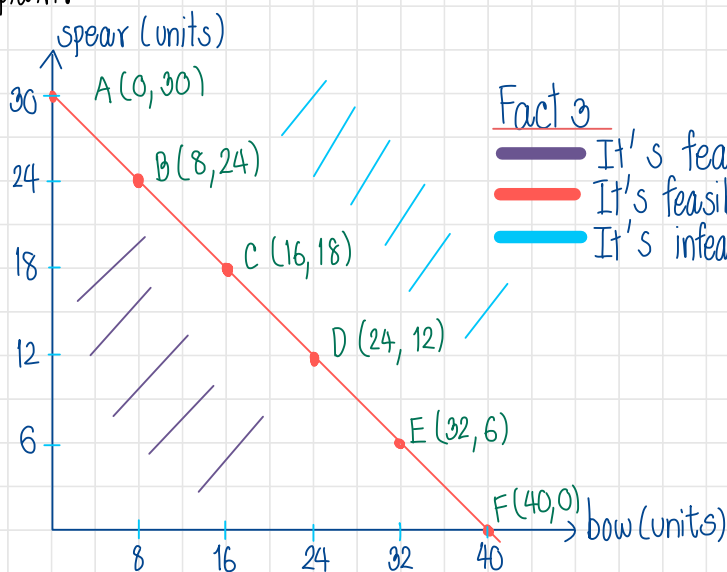


Assignment 1

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 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.

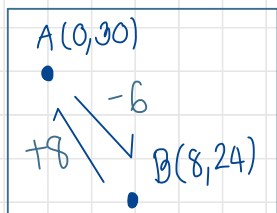
Answer



Fact 1 The line AF is called "Production Possibility Curve"

Fact 2 From the PPC, when using 120 woods, 30 spears can be produced but can't produce bows. When producing 24 spears, there are 8 bow crafting sticks left. when producing 18 spears, there are 16 bow crafting sticks left. when producing 12 spears, there are 24 bow left. when producing 6 spears, there are 32 bow left. Finally, he can't produce spears; there are 40 bow left.

Fact 4 Trade-off



given limited resources, more bow $\rightarrow$ less spear
more spear $\rightarrow$ less bow

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

Answer opportunity cost for each spear. I will create a schedule

Spear(Y)	Bow(X)	$\frac{\Delta Y}{\Delta X}$
30	0	-0.75
24	8	-0.75
18	16	-0.75
12	24	-0.75
6	32	-0.75
0	40	-0.75

$\frac{y_2 - y_1}{x_2 - x_1}$
constant

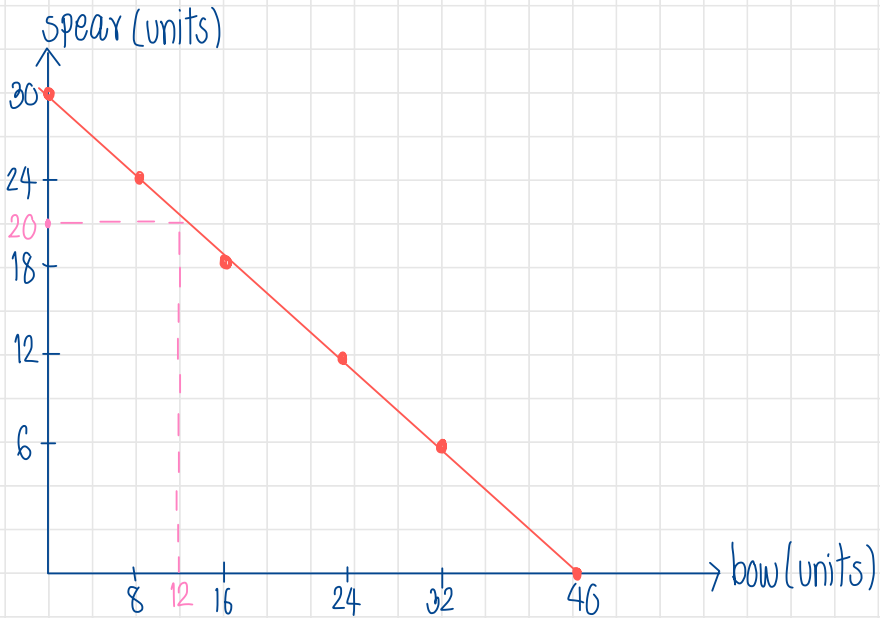
Find slope from $\frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 0}{24 - 30} = \frac{-3}{-6} = -0.75$ opportunity cost for an extra spear

Therefore, Opportunity cost of having an extra unit of spear is equal to 0.75, 0.75 unit of bow forgone. #

e.g. B (8-0.75, 24) = B' (7.25, 24)

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.

Answer

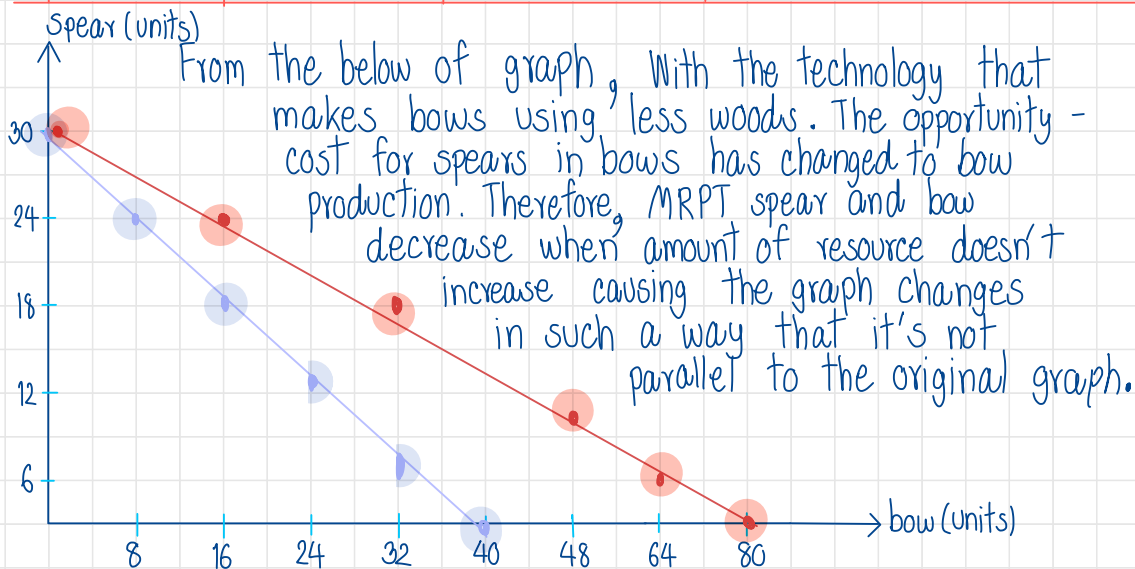


From the above of graph, it shows that using woods 120 units it can produce spears 20 units and bow 12 units. Thus, it is possible to produce but it's inefficient because the production quantity would yield 4 woods, so to make more efficient one more spear might have to be produced to completely run out of wood. #

1. d) If a new method of making bows 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.

Answer I will create the schedule again and then I create the graph as well.

Spear (Y)	Bow (X)	Bow (1.5 unit)	Original opp. cost	New opp. cost
30	0	0	0.75	0.375
24	8	16	0.75	0.375
18	16	32	0.75	0.375
12	24	48	0.75	0.375
6	32	64	0.75	0.375
0	40	80	0.75	0.375

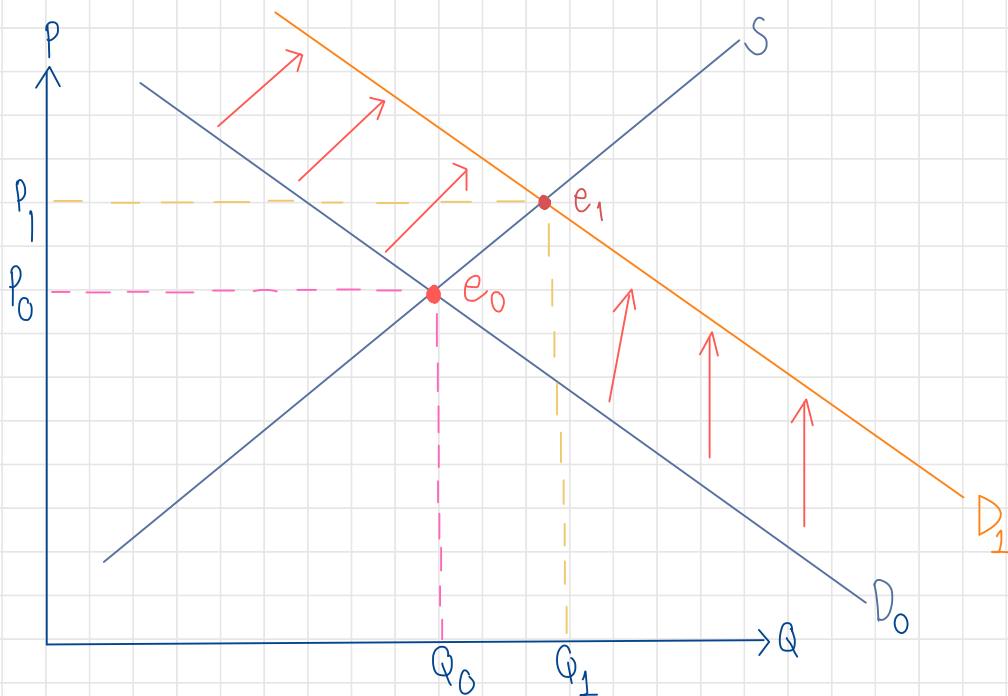


* I'm really sorry for my wrong scale *

2.) Assumed that a computer devices market is perfectly competitive, answer the following questions in detail.

2.a) Draw a graph showing that the computer devices market is in equilibrium at a certain original equilibrium price P_0 and equilibrium quantity Q_0 . During the pandemic, many people are assigned to work from home and computer devices are crucial. Does the market demand or market supply of computer devices change? Explain.

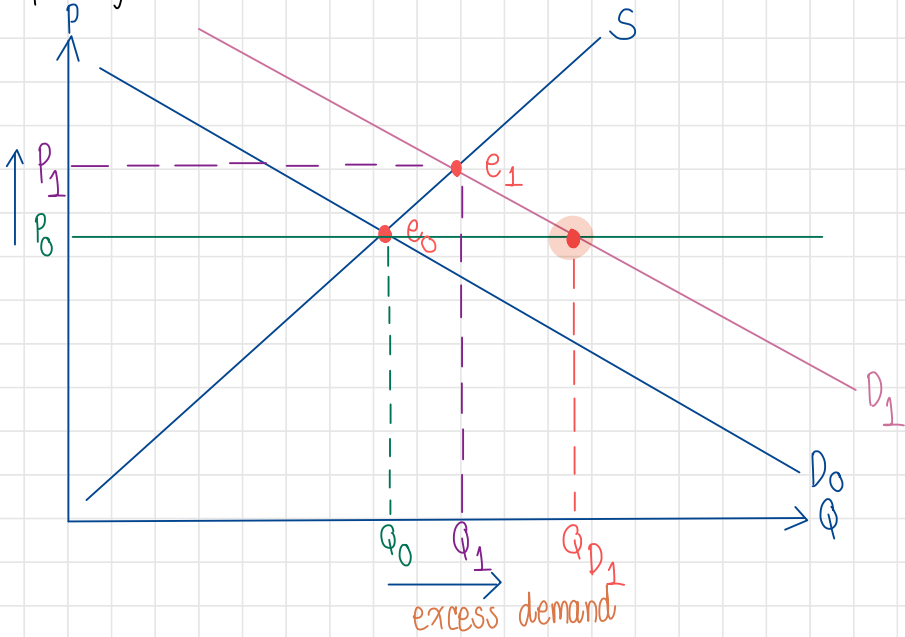
Answer



From the above of graph, In normal conditions, computers are at equilibrium at the price level P_0 has a quantity at Q_0 . Afterwards, when a new wave of epidemic is coming it causes people have to work from home. It leads to increase demand, so D_0 shifted to D_1 . This is caused the equilibrium change from e_0 to e_1 . However, the supply remained unchanged because the pandemic factor didn't affect the change in supply.

2.b) After what happened in 2.a), at the original equilibrium price P_0 will there be excess demand or excess supply? Show the new market equilibrium and state the equilibrium condition. Does the pandemic cause the equilibrium price and quantity to increase or decrease?

Answer

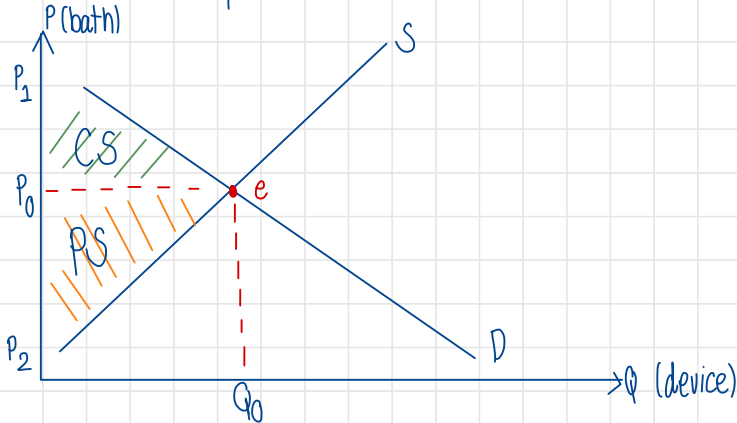


At the equilibrium price P_0 and equilibrium quantity at Q_0 , so the equilibrium price at e_0 . Subsequently, there was a change in equilibrium due to the pandemic. It causes the equilibrium price shifted from e_0 to e_1 . Hence, the quantity demand changes in an increasing direction. When mention at P_0 it stimulates excess demand ($Q_D > Q_S$). At the new equilibrium it will increase the equilibrium price and makes the quantity equilibrium increase because the pandemic creates most people have to work from home. Therefore, people will buy the computers more. And when producers produce more enough computers for people's demand, the graph will change and happen new equilibrium. Finally, To remove excess demand the price of computers will increase until excess demand equal to zero.

2.c) From the situation in 2.b), compare the consumer surplus and producer surplus in this computer market before and during the pandemic

Answer

Before the pandemic



From the graph, General condition
I assume the equilibrium level of
computers have equilibrium price
at $P(0) = 10,000$ bath, $Q_0 = 100$
devices. Consumers can purchase
the maximum price at $P(1) = 11,000$
bath. While producers satisfied with
producing computers in minimum
price at $P(2) = 8000$ bath.

$$\text{So } CS = \frac{1}{2} \times (P_0 - P_1) \times Q_0$$

$$CS = \frac{1}{2} \times 100 \times 1000 = 50,000 \text{ bath}$$

$$PS = \frac{1}{2} \times (P_0 - P_2) \times Q_0 \quad \oplus$$

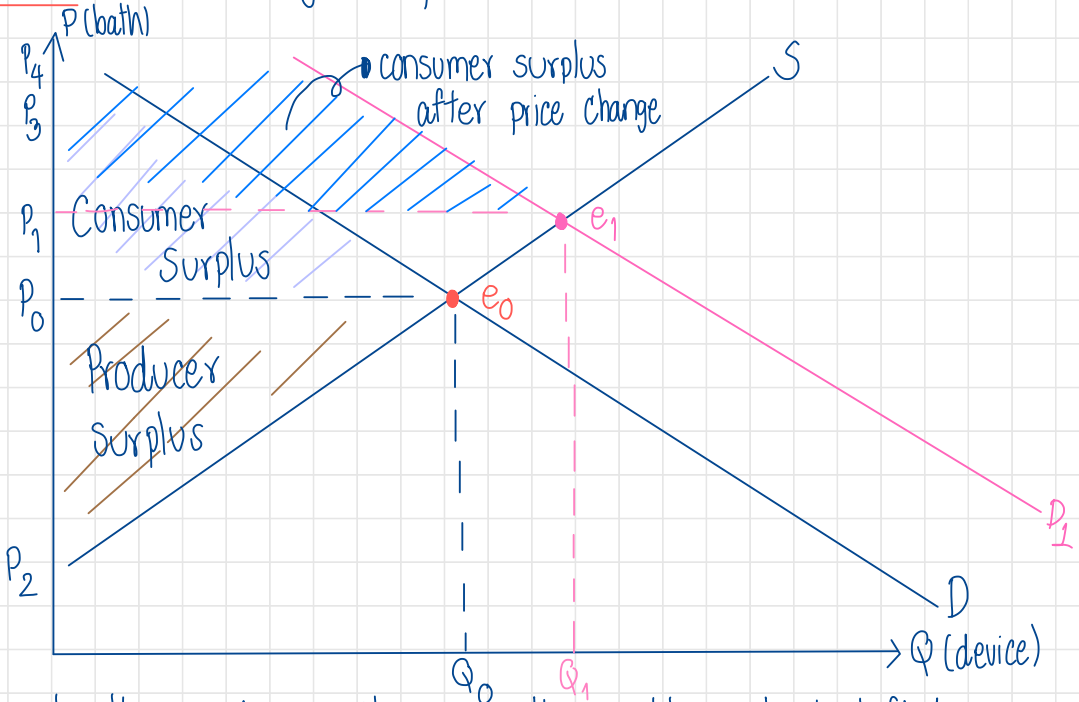
$$PS = \frac{1}{2} \times 100 \times 2000 = 40,000 \text{ bath}$$

$\therefore$ Total surplus equal to 90,000 bath

2.c) From the situation in 2.b), compare the consumer surplus and producer surplus in this computer market before and during the pandemic

Answer

During the pandemic

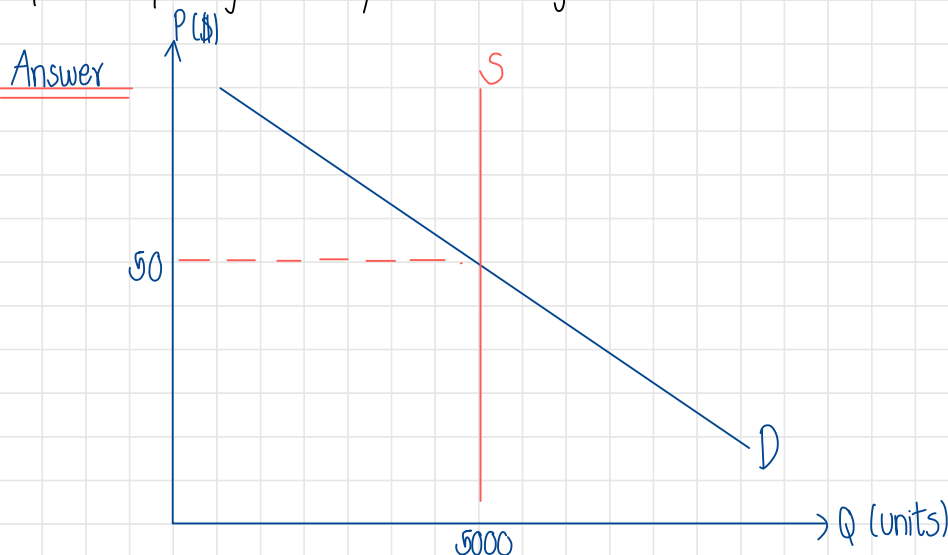


Due to the pandemic, it causes the equilibrium level shifted from e_0 to e_1 . The equilibrium price shifted from $P(0) = 10,000$ bath to $P(1) = 10,500$ bath and equilibrium quantity shifted from $Q(0) = 100$ devices to $Q(1) = 110$ devices. So the consumers can purchase computers in maximum price at $P(4) = 12,000$ bath. While the producers can produce the same as before the pandemic because the pandemic hasn't affected the supply. Consequently, New consumer surplus $= \frac{1}{2} (P_4 - P_3) \cdot Q_1$, $= \frac{1}{2} \times 1500 \times 110 = 82,500$ bath and producer surplus $= \frac{1}{2} (P_3 - P_2) \cdot Q_1$, $= \frac{1}{2} \times 2500 \times 110 = 137,500$ bath, so total surplus equals to 220,000 bath (PS+CS)

From the situation, The pandemic makes the demand to buy computers increase. Consumers are able and willing to buy computers in higher price. It causes the consumer surplus increase as well. Thus, the producer surplus increases at the same time because the price of computer is higher.

3.) Consider a System-on-a-Chip (SOC) market that is assumed to be perfectly competitive, due to a technical problem of production, there are only a few factories that can produce the next generation SoC. Answer the following questions in detail.

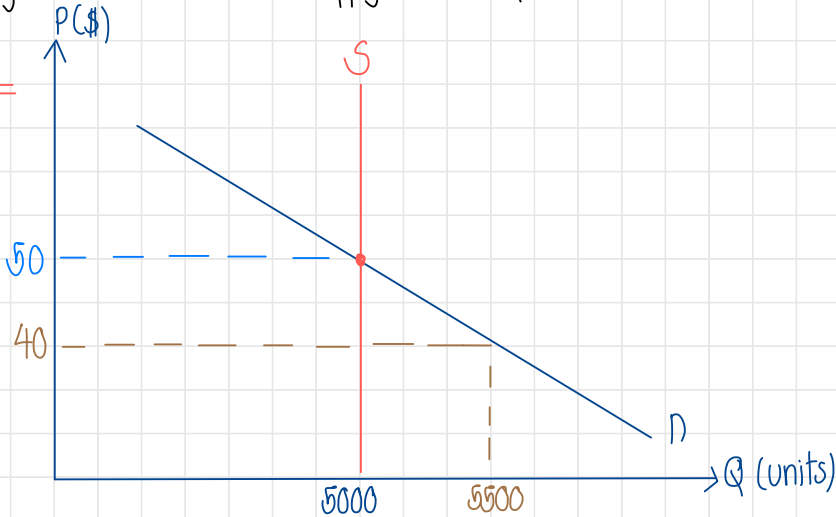
3.a) Draw a demand and supply on graph when demand has normal downward slope while supply is perfectly inelastic. The equilibrium price is at \$50 and the equilibrium quantity is at 5000 units a day.



From the above situation, Elasticity is a form of inelastic graph so the graph will have slope = 0. While the situation is limited that the equilibrium is at \$50 and the equilibrium quantity is at 5000 units. when I draw the demand it show as in the graph.

3.b) With the situation in 3.a), a study reveals that when the price drops to \$40, there will be 500 units of excess demand. Calculate the price elasticity of demand and supply at the equilibrium.

Answer



Find ϵ_d from $\frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \frac{Q_2 - Q_1}{P_2 - P_1} \cdot \frac{P}{Q}$

$$\epsilon_d = \frac{5500 - 5000}{40 - 50} \cdot \frac{50}{5000} = \frac{-500}{-10} \cdot \frac{1}{100} = \frac{5}{10} = 0.5 \text{ or } 0.5 \#$$

$\epsilon_d = 0.5 \Rightarrow$ Demand for products in price inelastic

$\epsilon_d < 0$
↓
Inelastic

Find ϵ_s from $\frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q} = \frac{Q_2 - Q_1}{P_2 - P_1} \cdot \frac{P}{Q_1}$

$$\epsilon_s = \frac{5000 - 5000}{40 - 50} \cdot \frac{50}{5000} = \frac{0}{-10} \cdot \frac{1}{100} = 0 \#$$

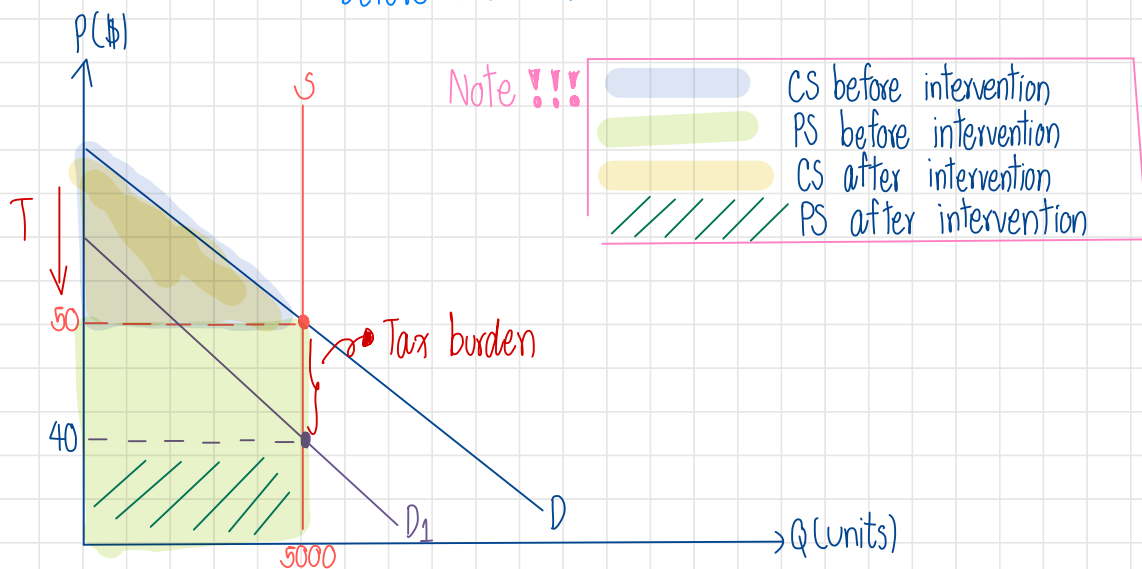
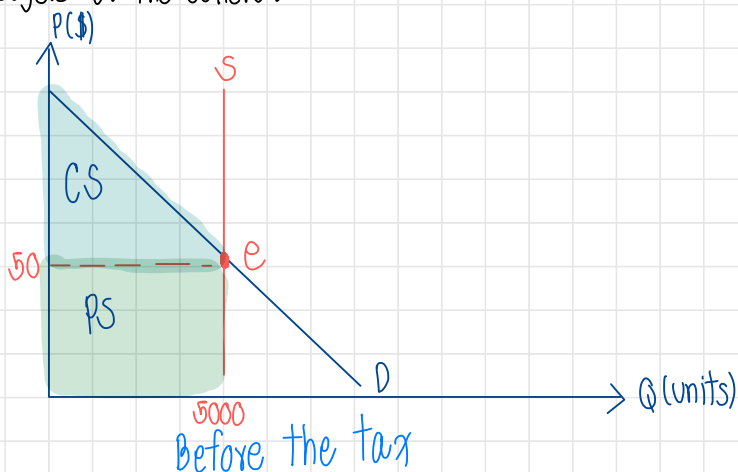
This is perfectly inelastic supply because Price ↓ but Q_s unchanged

$$\epsilon_s = \frac{0}{-10} \cdot \frac{1}{100} = \frac{0}{1000} = 0 \#$$

So the price elastic demand has value 0.5 and the price elastic supply has value 0 #

3.C) With the situation in 3.a), if a unit tax is imposed on buyers for \$10, portray the result of this intervention including the new equilibrium price and quantity, deadweight loss, and tax burden. Also, indicate which part of the burden belongs to the buyers or the sellers.

Answer



In conclusion, when the supply curve is perfectly inelastic. There isn't deadweight loss (DWL) when the government intervenes in market-place. Deadweight loss can entirely happen when the quantity of products is be produced and consumed decreases because of the intervention. Similarly, No deadweight loss in this case because all burden can be put onto producers.