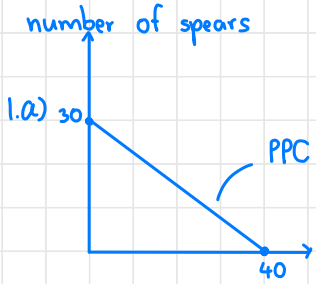
1.a)



$4S + 3B = 120$

when $S = 0$, $3B = 120 \rightarrow B = 40$

when $B = 0$, $4S = 120 \rightarrow S = 30$

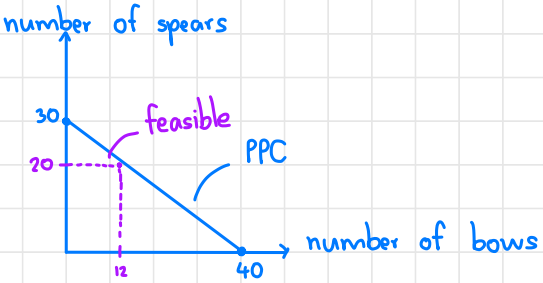
1.b) according to the PPC, the total wood source can be used to produce 30 spears or 40 bows.

S = spear, B = bow $\qquad 30S = 40B$

$$S = \frac{4}{3}B$$

$\therefore$ $\frac{4}{3}$ bows is the opportunity cost for each spear.

1.c)



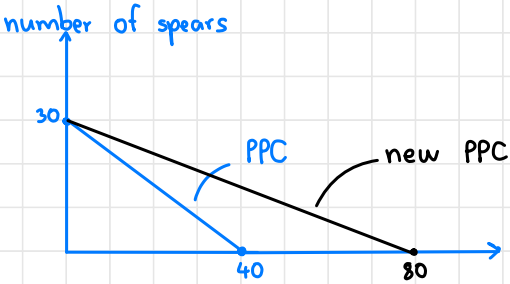
$S = 20, B = 12$

$4S + 3B = 4(20) + 3(12)$

$= 116$

This option is not efficient because it uses only 116 units but this wood source contains at most 120 units.

1.d)



$4(0) + 1.5B = 120$

$1.5B = 120$

$B = 80$

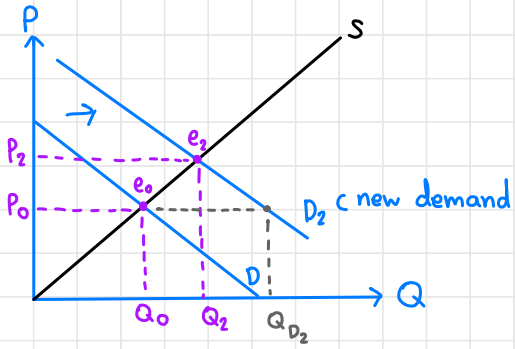
The new opportunity cost is more than the old opportunity cost.

according to the new PPC, the total wood source can be used to produce 30 spears or 80 bows. $\qquad 30S = 80B$

$$S = \frac{8}{3}B$$

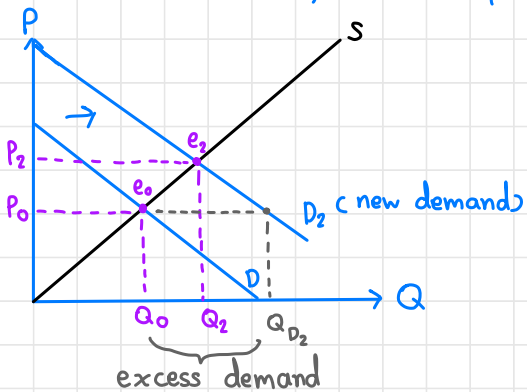
$\therefore$ $\frac{8}{3}$ bows is the new opportunity cost for each spear.

2.a)

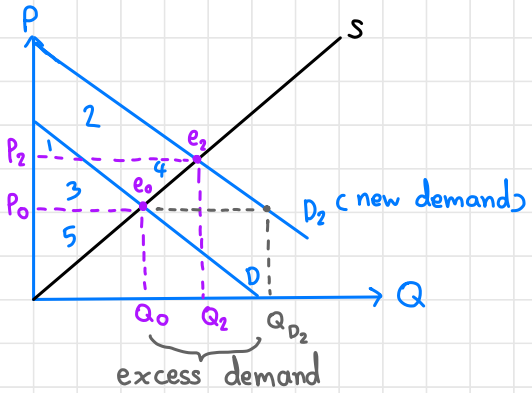


Due to the outbreak of COVID-19, many people need computer devices. Therefore, the market demand of computer devices increase.

2.b) According to the graph, there will be excess demand. The equilibrium price increases from P_0 to P_2, and the equilibrium quantity increases from Q_0 to Q_2.

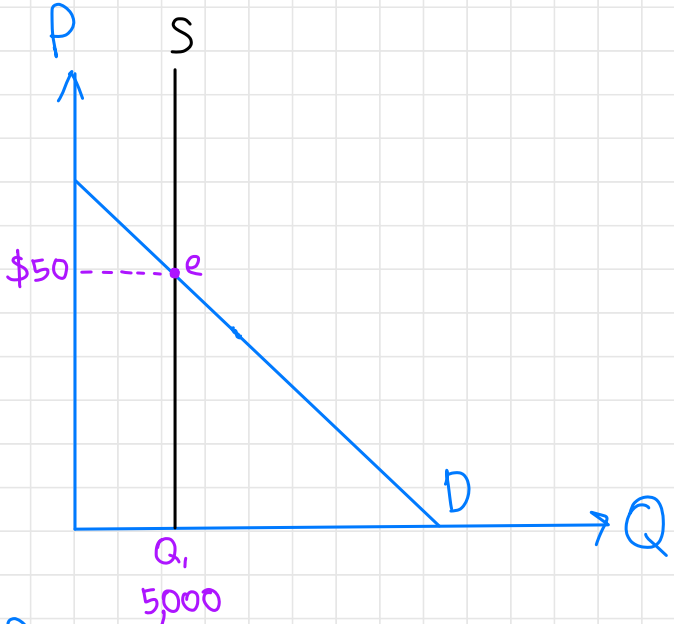


2.c)

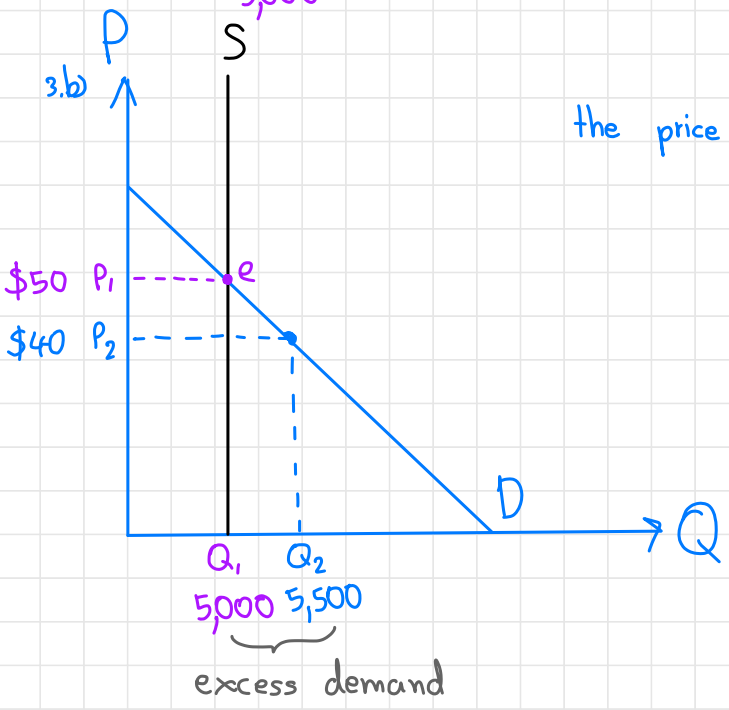


surplus	before	after
CS	1 3	1 2
PS	5	3 4 5

3.a)



3.b)



the price elasticity = $\frac{\Delta P}{\Delta Q}$

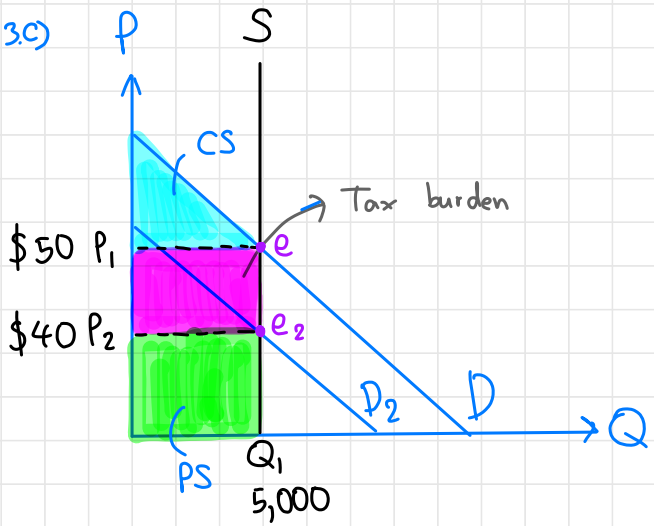
$= \frac{P_2 - P_1}{Q_2 - Q_1}$

$= \frac{40 - 50}{5{,}500 - 5000}$

$= -\frac{10}{500}$

$= -\frac{1}{50}$

3.c)



- new equilibrium price is $40 with 5000 units of the equilibrium quantity.
- no DWL in this case
- tax burden = $(P_1 - P_2) \cdot 5{,}000$

  $= (50-40) \cdot 5{,}000$

  $= \$50{,}000$

- tax burden is the part of the sellers.