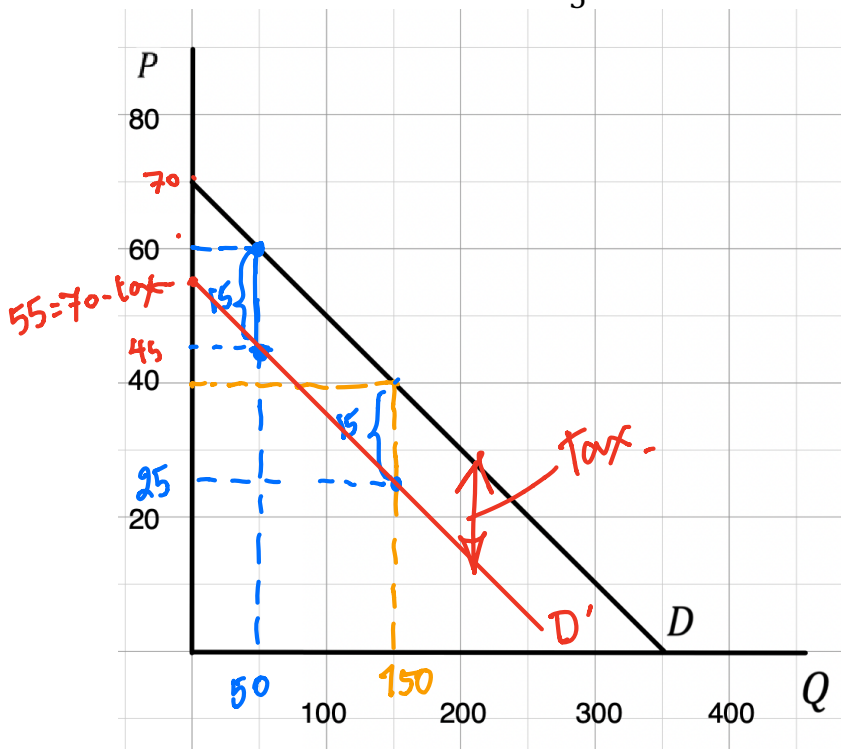


## Chapter 10 Applications of Demand and Supply (a)

**Case 2.** The *buyers pay tax* to the government  $t$  bahts/unit.

Tax  $t = 15$  bahts/unit on the buyers will affect the Demand curve. How?

$$D: P = 70 - \frac{1}{5}Q_D$$



*D - relationship between price and quantity, the buyers are willing and able to buy.*

*Price to seller + tax = 40.*  
15  
25

*D - same willingness & ability to pay if we consider the amount out of the pockets of buyers = (price to seller + tax).*

*But from the perspective of seller, it looks like the D has decreased because to convince the buyers to buy the same  $Q_D$  the price has to be lowered by  $15\text{฿} = \text{tax}$*

Given the Demand and Supply:

$$D: P = 70 - \frac{1}{5}Q_D$$

$$\begin{aligned} D': P &= (70 - t) - \frac{1}{5}Q_D \\ &= (70 - 15) - \frac{1}{5}Q_D \\ &= 55 - \frac{1}{5}Q_D \end{aligned}$$

$$S: P = 10 + \frac{1}{10}Q_S$$

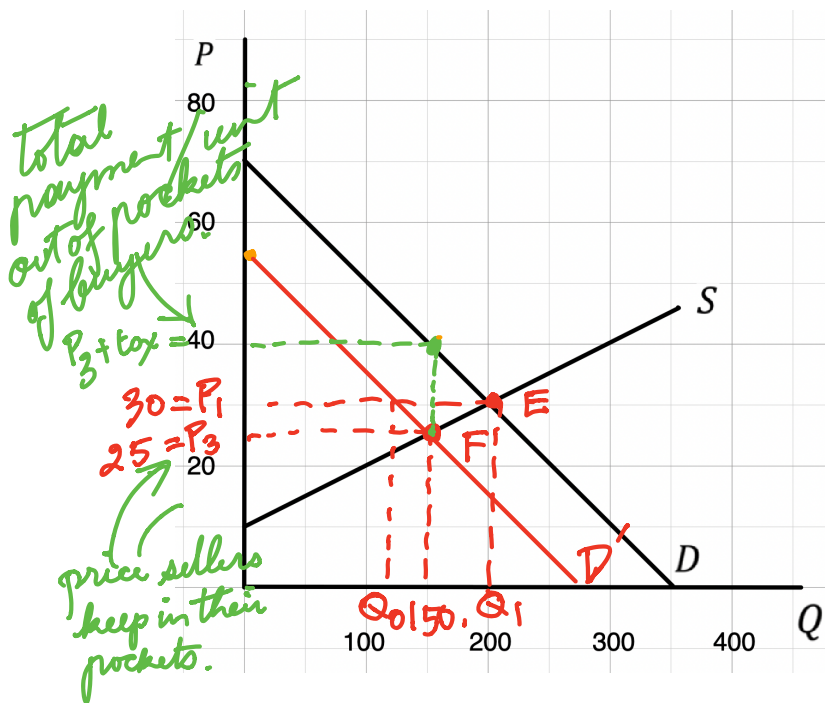
tax on buyers.

-t is on LHS.

$$(70 - t) - \frac{1}{5}Q_2 = 10 + \frac{1}{10}Q_2$$

$$Q_2 = 150.$$

$$\begin{aligned} S: P &= 10 + \frac{1}{10}Q_2 = 25 \\ D': P &= 55 - \frac{1}{5}Q_2 = 25 \end{aligned}$$



Before tax, the equilibrium is at  $E = (Q_1, P_1) = (200, 30)$ .

Once tax is imposed, at the original equilibrium price  $P_1$  there is an Excess  $S = Q_1 - Q_0$

⇒ The price thus will ~~increase/decrease~~ from 30 to 25.

The new equilibrium will be at  $F = (Q_2, P_2) = (150, 25)$

Solving equations to find the new equilibrium:

With tax,

the eq. quantity decreases from  $Q_1 = 200$  to  $Q_2 = 150$

the eq. price ~~increases~~/decreases from  $P_1 = 30$  to  $P_3 = 25$ .

Question: Is  $P_2$  the price the buyers pay or the sellers receive in their pockets?

~~$P_3 = 25$ .~~

**Tax Burden (Tax Incidence)** (Compare the total payment out of the pockets of buyers and total amount received by the sellers)

Buyers pay 25 to sellers. } = 40.  
and 15 = tax to govt.

**Before:**

Price the buyers pay  $P_1 = 30$ , sellers receive  $P_1 = 30$

**After:**

Price the buyers pay = , sellers receive = 25

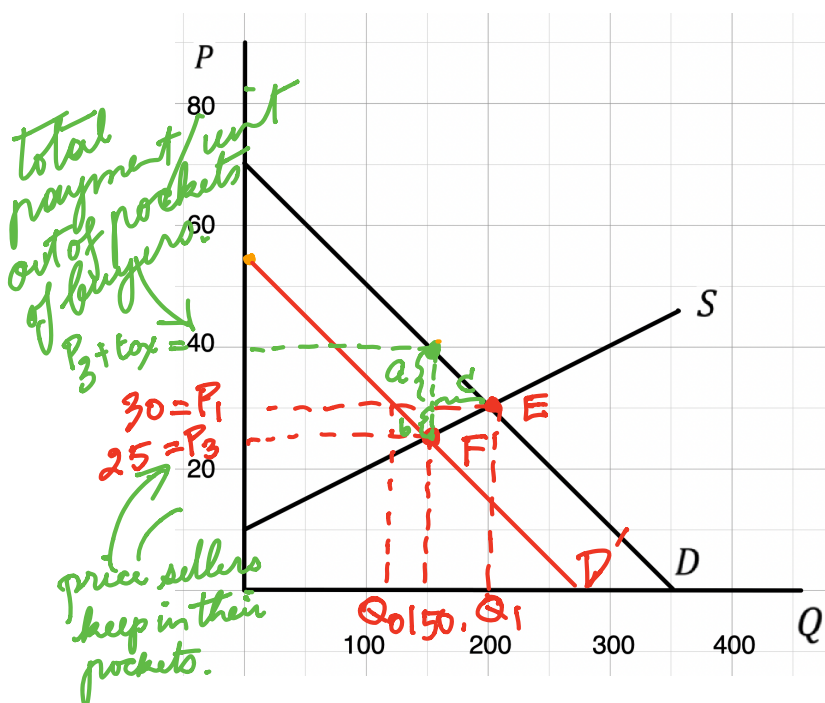
**Tax burden:** Buyers' =  $(25 + \text{tax}) - 30$  bahts/unit = 10 bahts.

Sellers' =  $30 - 25 = 5$  bahts/unit

**Total Tax burden:** Buyers' = } same bahts = Area  
Sellers' = } bahts = Area

**Total Tax Collected:**

**Share of Tax Burden:**

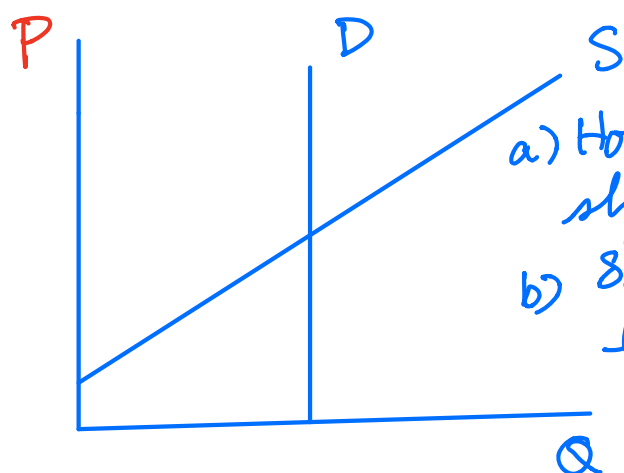
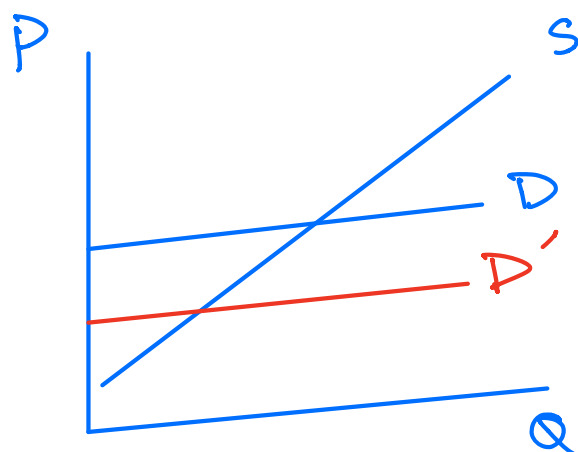
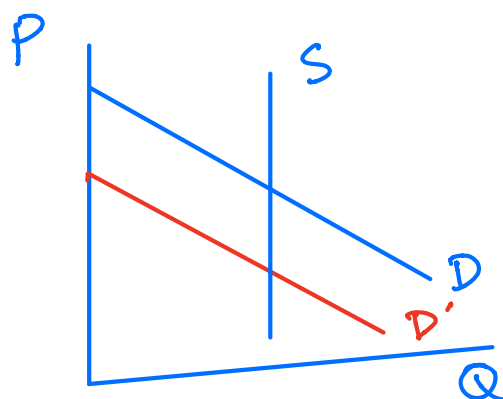
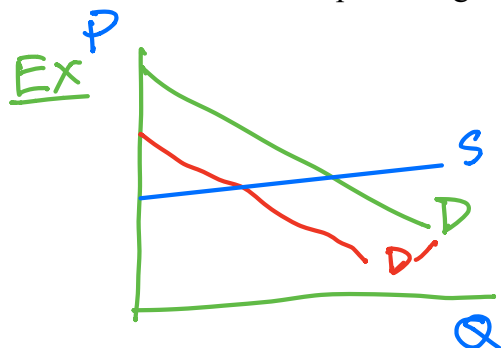


**Note;** Since the tax burdens shared by the buyers and sellers when buyers pay the tax are identical to the case the sellers pay the tax, we have exactly the same results of the

share of tax burden. We also have the same deadweight loss.

What is the value the buyers place on the last unit bought?

What is the cost of producing the last unit sold?



- a) How would D shift due to tax?  
b) Show tax burden of buyers + sellers.