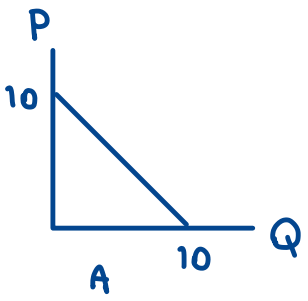
Example 3.G: Solve for the market equilibrium using the information in **Example 3.E** and **Example 3.F.** Justify your answer!

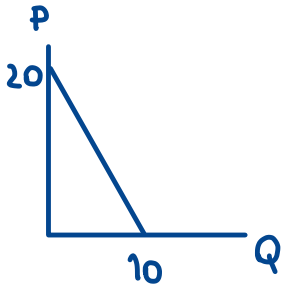
2 consumers

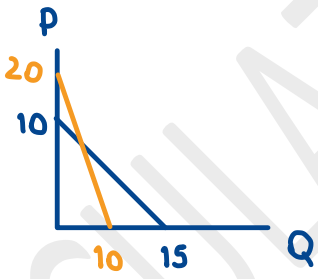
A : $Q_A = 10 - P$

B : $Q_B = 10 - \frac{1}{2}P$

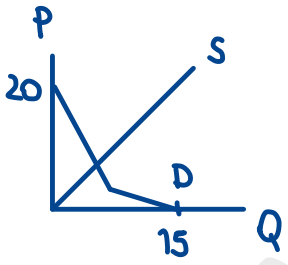
1.1)







1.2)



there are 1 buyer in the mk

$$Q_{mk} \begin{cases} 10 - \frac{1}{2}P ; P > 10 \\ 20 - \frac{3}{2}P , P \leq 10 \end{cases}$$

Example 3.J: Excess burden *formula under linear model & Tax-Revenue-maxizing tax rate*

Demand: $p^d = a - bQ^d \quad ; \quad a \geq 0, \quad b \leq 0.$

Supply : $p^s = c + dQ^s \quad ; \quad d \geq 0.$

- Solve for quantity and prices equilibrium when the unit tax is imposed. Analyze the result

$$Q^d = \frac{a-P}{b}$$

$$Q^s = \frac{P-c-t}{d}$$

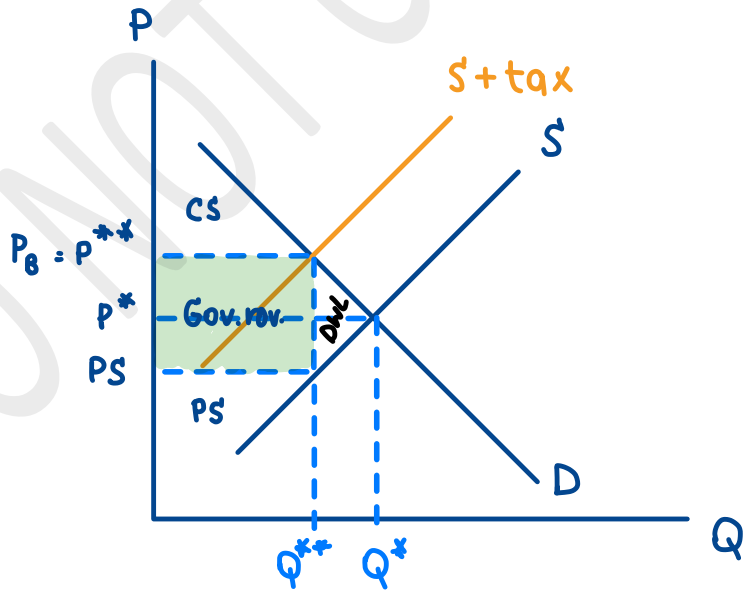
Equm. $P^s = P^d$

$$c + dQ^s + t = a - bQ^d$$

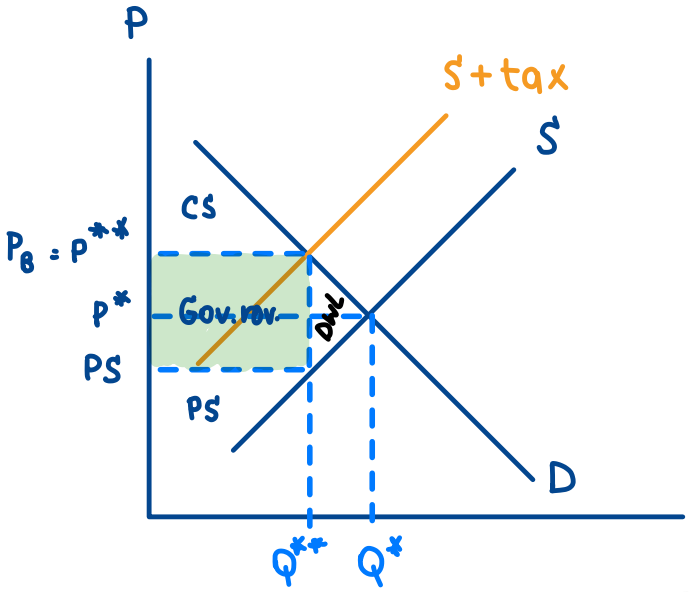
$$Q(d+b) = a - c - t$$

$$Q^{**} = \frac{a-c-t}{d+b}$$

$$P^{**} = c + t + d\left[\frac{a-c-t}{d+b}\right]$$



- Derive the excess burden formula for buyers and sellers



Before tax : consumers consume at Q^* while producer sell at P^*

After tax : consumers buy at a higher price at Q^{**} and producer will receive less at P_S

extra price for consumer : $-(P_B - P^*) \cdot Q^{**}$

extra price for producer : $-(P_S - P^*) \cdot Q^{**}$

- Calculate the tax rate that maximizes the tax revenue of government.

$$\frac{\partial \text{tax rev.}}{\partial T} = \left[\frac{a-c-t}{d+b}\right] \cdot t$$

$$= at - ct - t^2 + d^{-1}t + b^{-1}t$$

$$= a - c - 2t - d - b$$

$$2t = a - c - d - b$$

$$t = \frac{a-c-d-b}{2}$$

Example 3.K ***Price control and Welfare***

Consider the market for apartment rentals in Chicago. The price of rent is determined by the following system of equations.

Demand: $p = -2q_d + 160$

Supply: $p = q_s + 10$

- What is the equilibrium price and quantity in the market for apartment rentals?

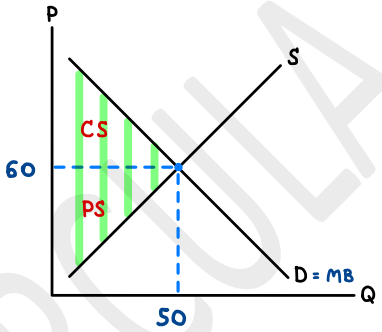
Equ^m : $p^s = p^d$

$Q^s + 10 = -2Q^d + 160$

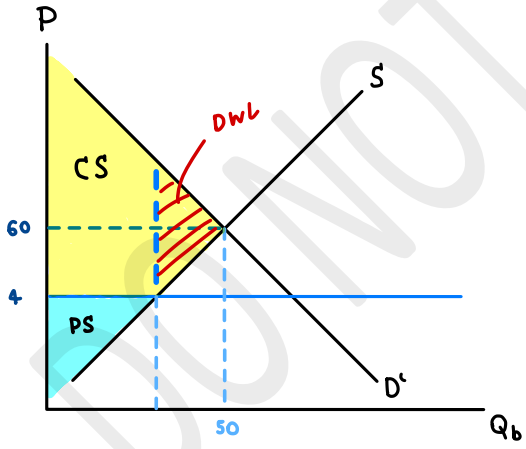
$3Q = 150$

$Q = 50$

$P = 60$



- Suppose the government tries to control the rent prices through a price ceiling of $40. Discuss the implication of this policy. Is there any deadweight loss?



This policy will decrease the quantity of renting, people will want to rent more due to the fall of price. The owner will decrease supply for renting apartment. The red triangle area is DWL.