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 seller

$Q = P$

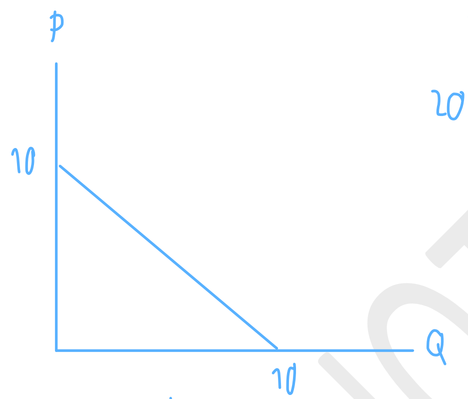
① draw diagrams

- individual demand
- market demand

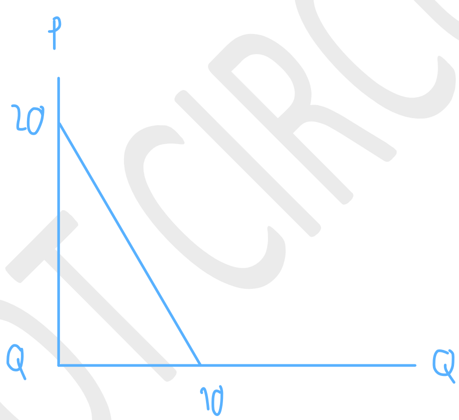
② find equilibrium

- how many buyers buy

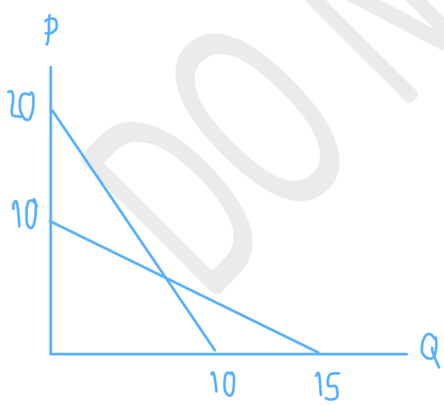
① consumer 1



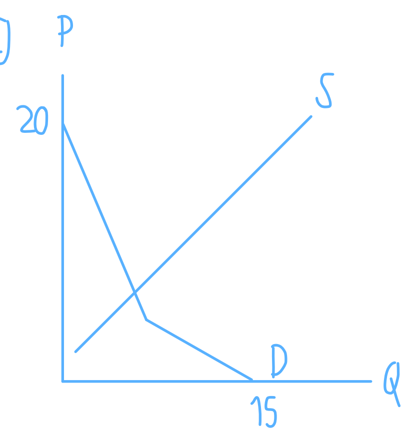
consumer 2



market



②



$$Q^D_{market} \begin{cases} 10 - \frac{1}{2}P ; & P > 10 \\ 20 - \frac{3}{2}P ; & P \leq 10 \end{cases}$$

there is only 1 buyer in the market.

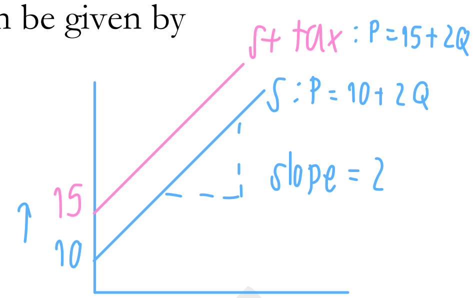
HW

Example 3.I Suppose that demand/supply equation can be given by

$$P^d = 80 - 3Q^d$$

$$P^s = 10 + 2Q^s$$

tax = 5



- Find the market equilibrium.

$P^d = P^s$

$80 - 3Q = 10 + 2Q$

$70 = 5Q \rightarrow Q^* = 14$

$P^* = 38$

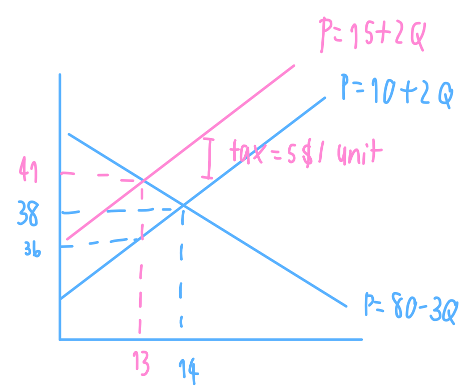
- Suppose that government imposes tax on producer equal to $5 per unit, determine market equilibrium under taxation.

new S: $P = 10 + 2Q + 5$

$P = 15 + 2Q$

$P^*_{tax} = 41$

$Q^*_{tax} = 13$



HW

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

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

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

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

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

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

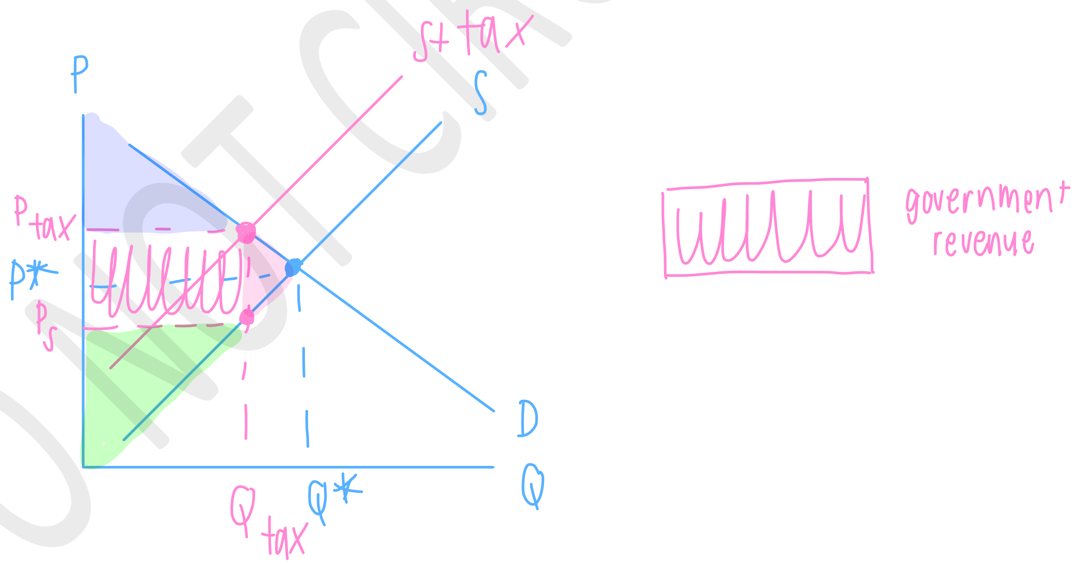
equilibrium : $p^s = p^d$

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

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

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

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



HW

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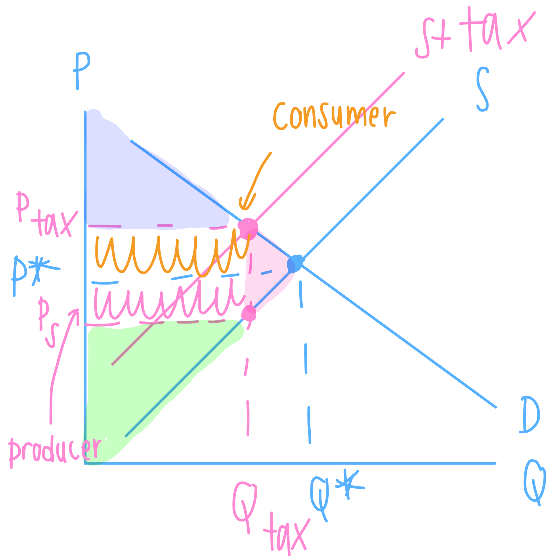
- Derive the excess burden formula for buyers and sellers



extra cost of consumers

$(P_{tax} - P^*) \times Q_{tax}$

extra cost of producers

$(P_S - P^*) \times Q_{tax}$

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

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

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

$$0 = a - c - 2t - d - b$$

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

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

<u>Example 3.K</u> ***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?

equilibrium: $P^S = P^d$

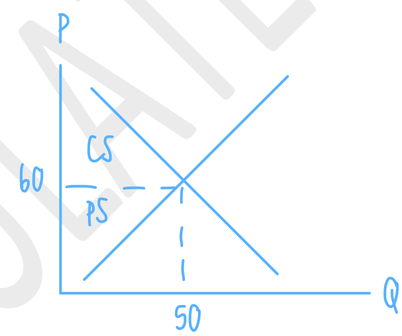
$Q^S + 10 = -2Q^d + 160$

$3Q = 150$

$Q = 50$

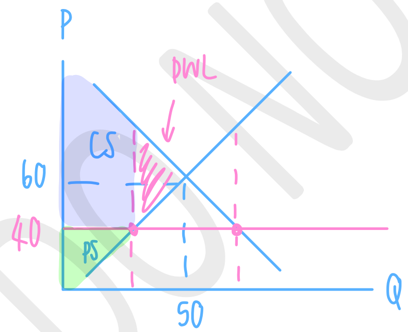
$P = 50 + 10$

$P = 60$



- 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?

The policy is helping consumer by reducing the price of apartment renting.



HW