

① 2 Consumer

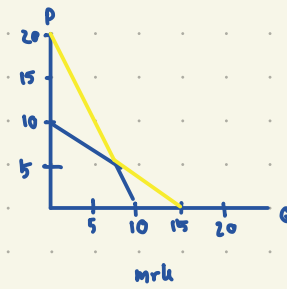
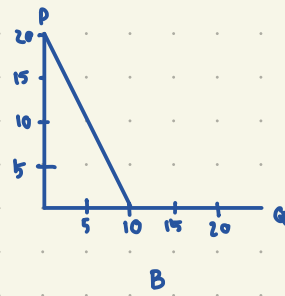
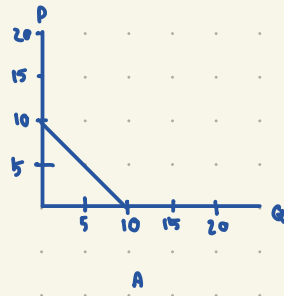
A : $Q_A = 10 - P \rightarrow P = 10 - Q_A$

B : $Q_B = 10 - \frac{1}{2}P \rightarrow P = 20 - 2Q_B$

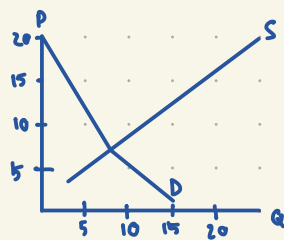
1 Seller

$Q = P$

1.1 draw individual demand and market demand diagram



1.2 find equilibrium and how many buyer there are



→ there are 1 buyer in the market

$$Q_{\text{mkt}} = \begin{cases} 10 - \frac{1}{2}P; & P > 10 \\ 20 - \frac{3}{2}P; & P \leq 10 \end{cases}$$

Example 3J: Excess burden formula under linear model & Tax-Revenue-maximizing tax rateDemand: $p^d = a - bQ^d$; $a \geq 0$, $b \leq 0$.Supply : $p^s = c + dQ^s$; $d \geq 0$.

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

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

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

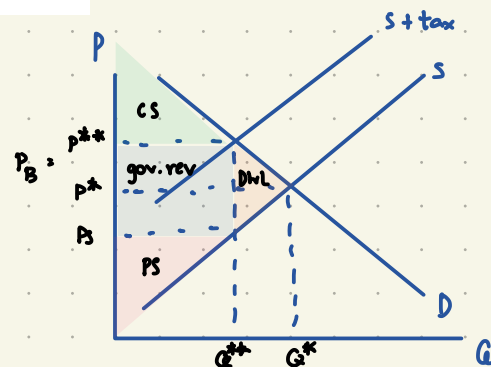
equilibrium : $p^s = p^d$

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

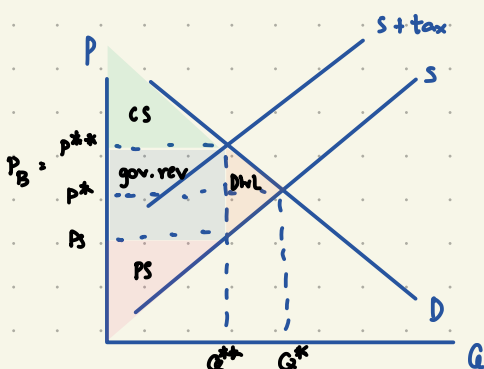
$$Q(d+b) = a - c - t$$

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

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



- Derive the excess burden formula for buyers and sellers



Before tax : consumers buy at P^* , which is cheap.
While seller can sell at high price (P^*)

After tax : consumers buy at higher price at P^{**} (P_B),
and producer will receive less at P_S

extra price that consumers pay is $= (P_B - P^*) \times Q^{**}$
extra price that producers pay is $= (P_S - P^*) \times Q^{**}$

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

$$\frac{a \text{ tax. rev}}{xT} = \left(\frac{a - c - t}{d + b} \right) \times t$$

$$= a - c - t^2 + d^{-1}t + b^{-1}t$$

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

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

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

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: $p = q_s + 10$

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

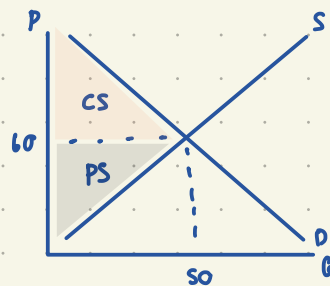
equilibrium : $p^s = p^d$

$$q_s + 10 = -2q_d + 160$$

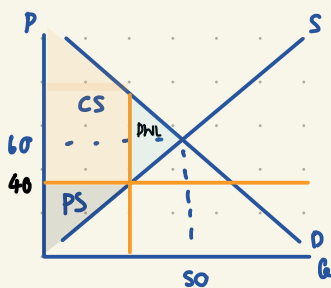
$$3q = 150$$

$$q = 50$$

$$p = 60$$



- o 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 announce to reduce the quantity of renting an apartment. By having a cheaper price people will demand more of apartment, while the owner of the apartment does not want to rent their room out. the blue area is dead weight loss.