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

$Q = P$

Find :

1) Draw Diagram

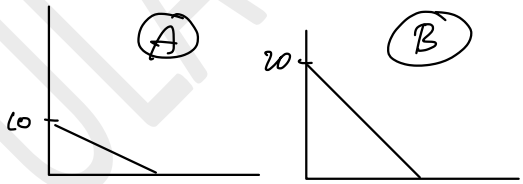
2) find eqm

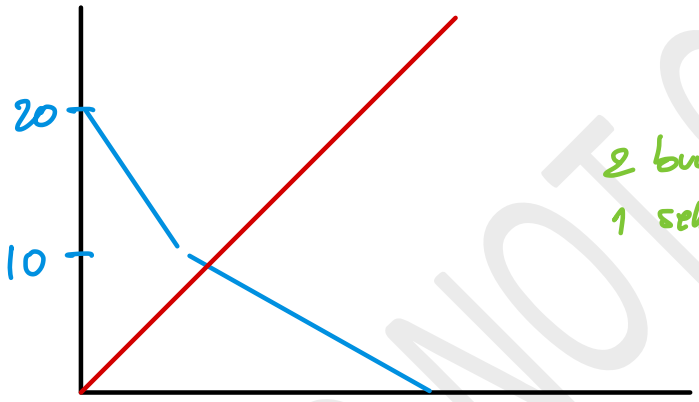
Soln

A : $P = 10 - Q_A$

B : $P = 20 - 2Q_B$

} Inverse Demand





2 buyers
1 sellers → use $Q^D_{mkt} = Q^D_A + Q^D_B$

$= 10 - P + 10 - \frac{1}{2}P$

$Q^D_{mkt} = 20 - \frac{3}{2}P$

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

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

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

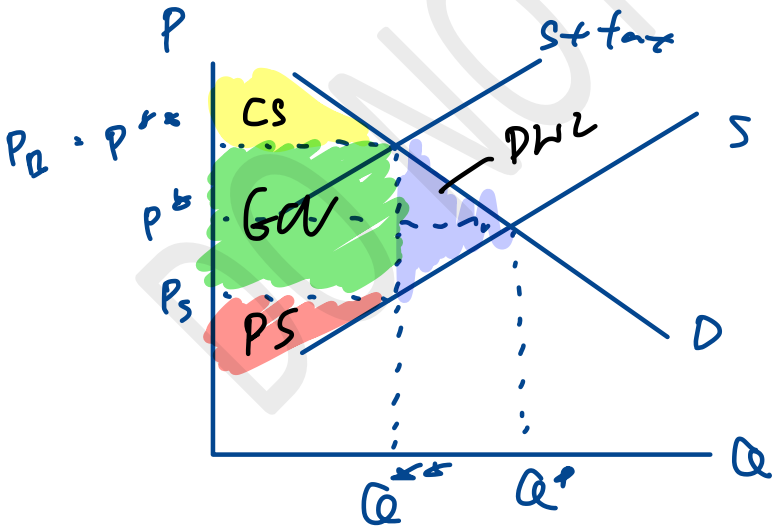
eqbm: $p^s = p^d$

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

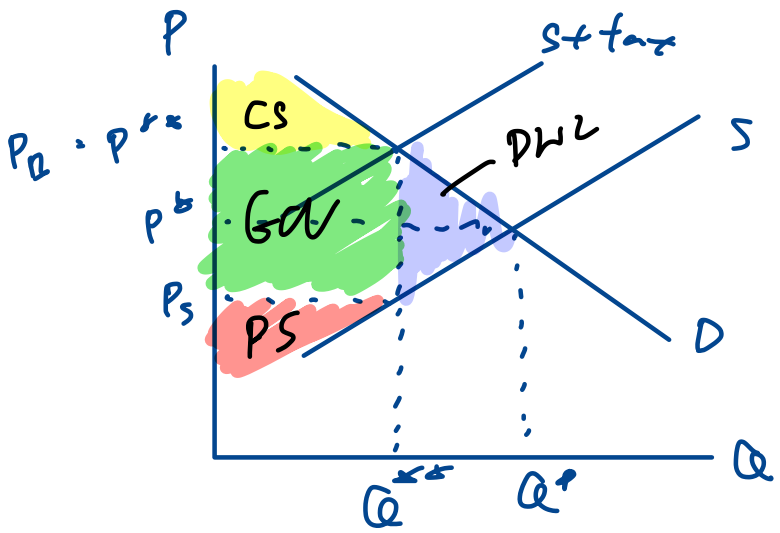
$Q(d+b) = a - c - t$

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

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



- Derive the excess burden formula for buyers and sellers



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

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

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

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

$$= \frac{at - ct - t^2 + dt + bt}{d+b}$$

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

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

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

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: $p = q_s + 10$

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

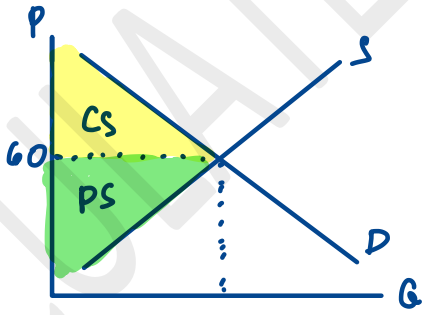
equi : $p^s = p^d$

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

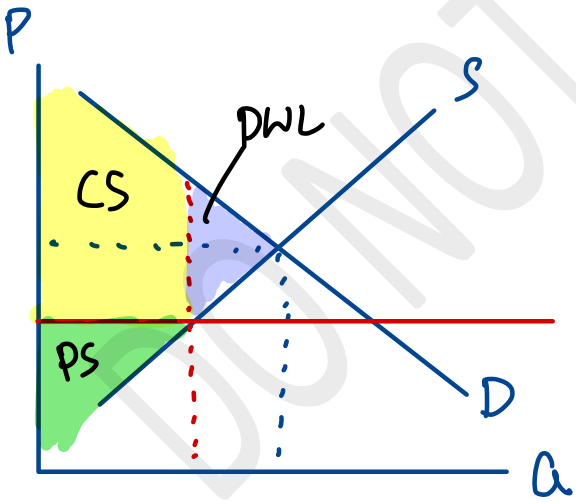
$3Q = 150$

$Q = 50$

$P = 60$



- 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?



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 doesn't want to rent their room out.