

Problem 1: Information about firms and consumer is provided below. N is number of identical firms on the market, P is price of the good of interest, P' is price of other good consumed by consumers, Q is quantity and I is income.

$$\text{Firm: } TC = 0.15q^2 + 10$$

$$\text{Consumer: } Q_D = 4000 - 500P + 200P' + 0.1I$$

$$N = 100, P' = 10, I = 40000$$

- (a) Find individual and market supply function
- (b) Find demand function
- (c) Find market equilibrium

Problem 2: Causes of shifts of demand and supply. Follow the set up from the previous problem. What happens if P' changes to 22.5?

Problem 3: Consider the following supply and demand functions.

$$\text{Supply: } P = 20 + 4Q$$

$$\text{Demand: } P = 200 - Q$$

Compute market equilibrium. Then suppose that the government imposed a per unit tax of 20 to be paid by producers. What will be the effect of the tax on market equilibrium?

Problem 4: Consider the following supply and demand function.

$$\text{Supply: } P = 4Q$$

$$\text{Demand: } P = 150 - Q$$

- (a) Find market equilibrium.
- (b) Calculate producer surplus, consumer surplus and total surplus.
- (c) Suppose now that the government impose taxes \$5 per unit sold. Calculate consumer surplus, producer surplus, government revenue, total surplus and deadweight loss.
- (d) Illustrate the situation in (c) graphically. Does it matter whether the tax is imposed on the producers or the consumers? Explain.