

# Tutorial 3 - Problems

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## Problem 1

Suppose that the demand for apples is perfectly elastic and the government levies a tax on the producers of apples. Assume that the supply of apples is neither perfectly elastic nor perfectly inelastic.

- a) How will the price paid by consumers change? Is this change bigger or smaller than the price change that would result if the demand for apples were not perfectly elastic?
- b) How will the quantity of apples consumed change due to the tax? Is this change in quantity larger or smaller than the change that would result if the demand for apples were not perfectly elastic?
- c) Explain the significance of your answers in both part a) and part b) in terms of how the tax affects the welfare of consumers in the apple market.

## Problem 2

In the market for apples, the demand curve is  $Q = 50 - 3P$  and the supply curve is  $Q = 2P$ . The Government decides to raise revenue by taxing consumers 2 for every apple purchased.

- a) Graph the supply and demand curves, and indicate how the curves shift after implementation of the tax. Calculate the pre-tax and after-tax equilibrium quantities and prices.
- b) Calculate the change in consumer and producer surplus from the tax.
- c) Calculate the burden of the tax borne by each party.
- d) Calculate elasticity of demand and supply at the equilibrium and use the elasticity formula to check your calculations at point b).
- e) Calculate the amount of revenues raised by the Government and the loss of efficiency for the society (DWL)
- f) Intuitively, why is there dead-weight loss from a tax? That is, what exactly does deadweight loss represent?

### Problem 3

Say whether the propositions are True or False and justify your answer.

- a) If the government imposes a binding price floor in the market, then the consumer surplus in that market will increase
- b) Connie can clean windows in large office buildings at a cost of \$1 per window. The market price for window-cleaning services is \$3 per window. If Connie cleans 100 windows, her producer surplus is \$100.
- c) A tax on insulin is likely to cause a very large deadweight loss to society.

### Problem 4

Suppose that the market for green tea can be described by the following demand and supply curves (prices are per kg):

$$Q_d = 260 - 5P$$

$$Q_s = 8P$$

- a) Find the market equilibrium in the absence of taxes. Draw the demand and supply curves, labelling all intercepts and the market equilibrium
- b) Draw the curves as in the last item, showing clearly the areas representing the consumer surplus (CS) and the producer surplus (PS). Calculate their values and the value of the total surplus (TS).
- c) Suppose now that the government decides to tax green tea by \$13 per kg. Calculate the tax equilibrium.
- d) Calculate and show on the graph the values of  $CS$ ,  $PS$ ,  $TAXR$ ,  $DWL$ .