Chapter 8 Practice Problems

Elements of Microeconomics (discussion section 4)

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Question 1

Consider the market for coffee. The equations for quantity demanded and quantity supplied are as follows:

$$Q_D = 100 - 4P$$
$$Q_S = 5P + 10$$

(a) Derive the inverse supply and demand equations ($P = ...$)

(b) Graph the inverse supply and demand equations.

(c) Is supply/demand elastic or inelastic in this case?

(d) Solve for the equilibrium price and quantity in this market, and illustrate this equilibrium on your graph.

(e) Indicate where on the graph represents the consumer and producer surplus in this market.

(f) Now, assume that there is a tax levied (on sellers) in the market for coffee in the amount of \$2 per cup. Does the supply or demand curve shift?

(g) What is the new equation for Q_S *and* the inverse supply curve?

(h) Add this new inverse supply curve to your existing graph.

(i) Has the supply curve shifted left or right? By how much has the curve shifted?

(j) What is the new price faced by buyers in this market with the tax? What is the new price faced by sellers in this market with the tax?

(k) Indicate the areas on the graph which represent the producer surplus, consumer surplus, tax revenue, and dead weight loss.

(l) Calculate the values of the producer surplus, consumer surplus, tax revenue, and dead weight loss after the tax is levied in this market.

(m) Would the dead weight loss increase or decrease if the same tax was levied and (ceteris paribus) $Q_S = \frac{1}{2}P + 10$? What if (ceteris paribus) $Q_D = 100 - P$? Why is this the case?

Question 2

Assume we are in the market for cars, and a tax has been levied on the car manufacturers of size $\$X$. Illustrate the dead weight loss caused by this tax in the following 4 scenarios on a supply/demand graph:

(a) Supply is elastic, demand is inelastic

(b) Supply is elastic, demand is elastic

(c) Demand is elastic, supply is inelastic

(d) Demand is elastic, supply is inelastic

Question 3

Consider the market for twizzlers. Assume demand and supply are both relatively elastic in this market. Illustrate the dead weight loss and tax revenue caused by a tax of the following three sizes:

1. \$2 per twizzler
2. \$4 per twizzler
3. \$6 per twizzler

What happens to the size of the tax revenue as the size of the tax increases?

***(Note that I did not give any specific equations for Q_S or Q_D, so you can't calculate the DWL or TR, I just want you to show what happens to DWL/TR as the tax per twizzler increases, nothing precise is necessary)