Chapter 7 Practice Problems Solutions

Elements of Microeconomics

Discussion section 4

Question 1

Consider Figure 1 from chapter 7 in the textbook.

What happens to the auction price if there is only one record at auction but there is another buyer, Yoko, who also values the record at $100?

Answer:

Now the auction price will be bid up to $100.

Before, once the auctioneer reached $80, all three other bidders dropped out and John could buy the record. It is too expensive for any of the other purchasers, but the buyer cannot get a higher price from John.

Now, when the auctioneer calls out $80, Yoko is willing to pay $81, since the price is still below her willingness to pay of $100. But then John calls out $82, for the same reason; this process repeats until they reach a price of $100.

Question 2

Consider the market for coffee in figure 1.

Part A

Draw the total surplus at the market equilibrium, identifying consumer surplus and producer surplus.

Answer:

Your graph should look like figure 2. Consumer surplus is given by A_1, showing the difference between the market price and the willingness to pay at each point. The producer surplus is given by A_2, showing the difference between the market price and producer cost at each point. The total surplus is just $A_1 + A_2$.

Part B

Now suppose the government imposes a tax on consumption of coffee.

1. Illustrate the impact of the tax on the market equilibrium; what happens to P and Q?

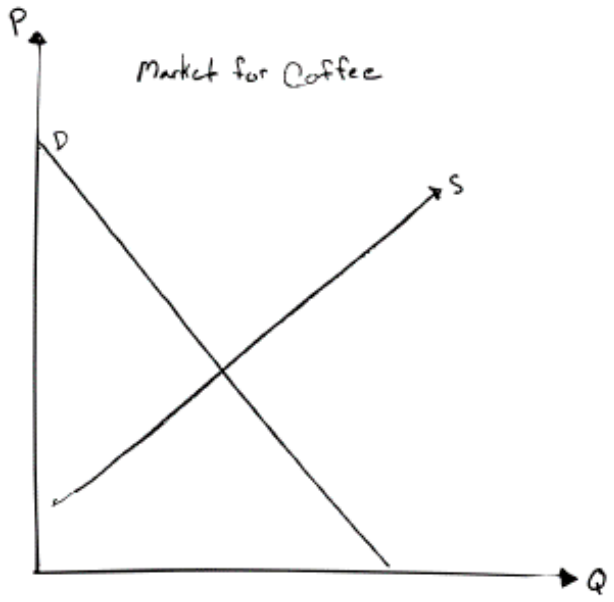

Figure 1: Coffee market

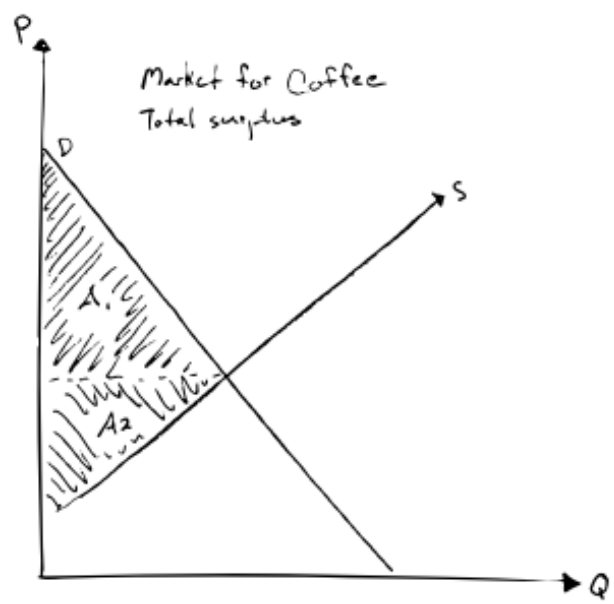

Figure 2: Coffee market

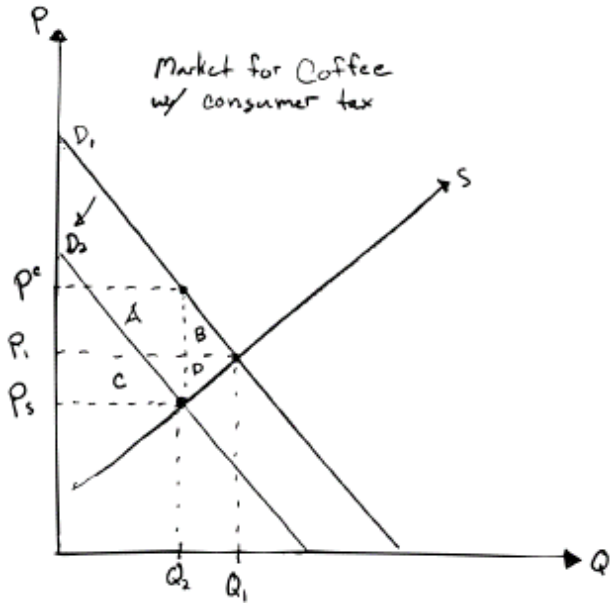

Figure 3: Coffee market with consumer tax

2. What happens to consumer surplus?

3. Producer surplus?

4. Total surplus?

Answer:

The new market equilibrium is given in figure 3. The tax shifts the demand curve to the left; now consumers are paying P_c, but producers only receive P_s. The new equilibrium price and quantity are lower.

The effects on surplus are:

- Consumer surplus decreases by $A + B$
- Producer surplus decreases by $C + D$
- Government revenue is given by $A + C$
- $(A + C) - (A + B) - (C + D) = -(B + D)$ is deadweight loss

Part C

Now suppose the government provides a subsidy to producers for each cup of coffee they sell, and answer the same questions as in Part B.

Answer:

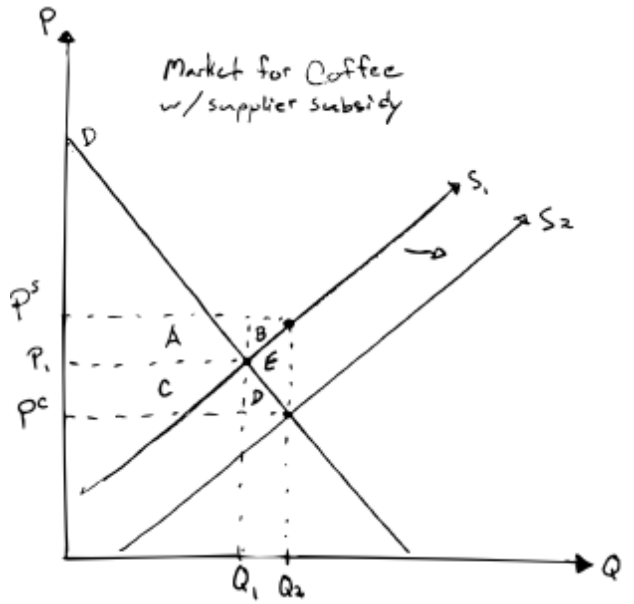

Figure 4: Coffee market with producer subsidy

The new market equilibrium is given in figure 4. The tax shifts the supply curve to the right; now consumers are paying P_c, but producers actually receive P_s. The new equilibrium price is lower and quantity is higher.

The effects on surplus are:

- Consumer surplus increases by $C + D$
- Producer surplus increases by $A + B$
- Government spends $A + B + C + D + E$
- $(C + D) + (A + B) - (A + B + C + D + E) = -E$ is deadweight loss

Part D

With the two policies, does the government increase or decrease total surplus? How does the change in total surplus compare to the change in government revenue?

Answer:

The tax decreases surplus for both consumers and producers. In the tax, the government revenue is strictly smaller than the decrease in surplus; the difference is the deadweight loss.

The subsidy increases surplus for both consumers and producers. However, the revenue that the government must spend to acheive this increase is strictly larger; the difference is the deadweight loss from the policy.

The take-away is that in our simplistic model of a perfectly competitive market, there is always some deadweight loss.

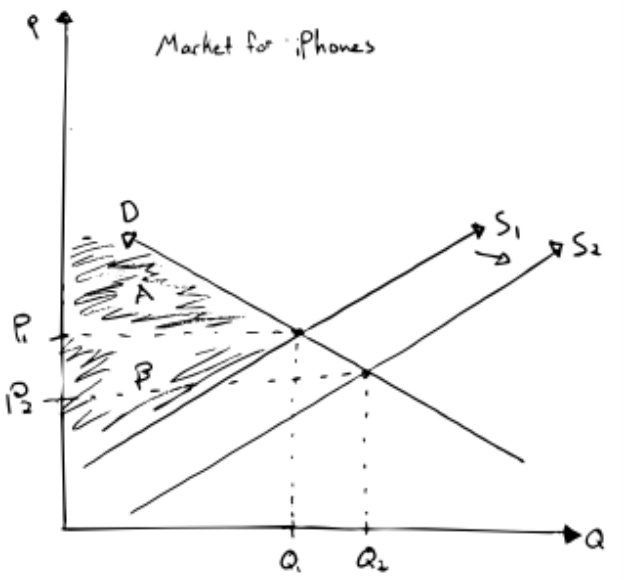

Figure 5: Market for iPhones

Question 3

Let's consider the market for iPhones.

Part A

Is the demand for iPhones elastic or inelastic? What about supply?

Answer:

You could argue for either elastic or inelastic supply and demand. Demand may be elastic because there are close substitutes, such as android or Huawei phones, and the fact that a smartphone is in some sense a luxury good. Demand may be inelastic because in reality, having a smartphone is necessary for communication and work in 21st century America, and many people are "locked in" to Apple's technology infrastructure. Supply may be elastic because Apple makes millions of these items and can scale-up or down supply, but may be inelastic because it is a capital-intensive production process with large investments in technological research.

Part B

Assume supply and demand are both fairly elastic (slope around 1). Illustrate the impact of a decrease in the cost of production, and show the change to surplus.

Answer:

The original market is given by figure 5. A decrease in the cost of production shifts the supply curve down and to the left, and increases total surplus for both consumers and producers, shown in figure 6.

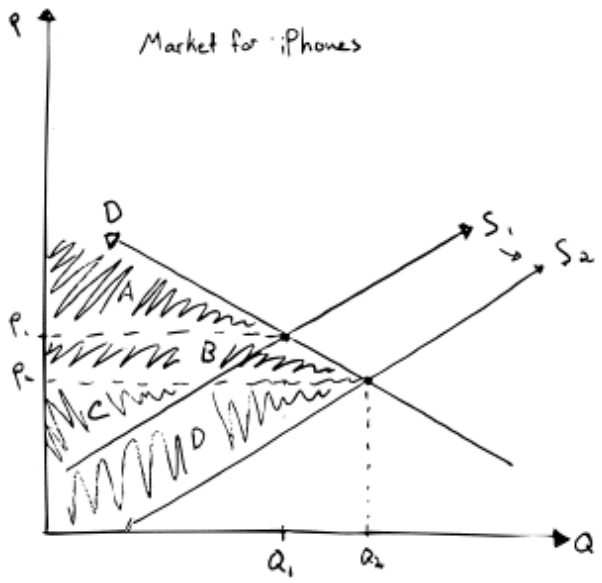

Figure 6: Change to surplus in the market for iPhones

Part C

Now suppose that the demand curve for iPhone is very inelastic (close to vertical), and answer the same questions.

Answer:

The original market is given by figure 7 and the new surpluses are shown by figure 8. Total surplus still increases, and surplus increase for both consumers and producers. However now the increase in surplus mostly occurs for consumers; this is because with inelastic demand they have a very high willingness to pay, and so the difference between willingness to pay and price is very large.

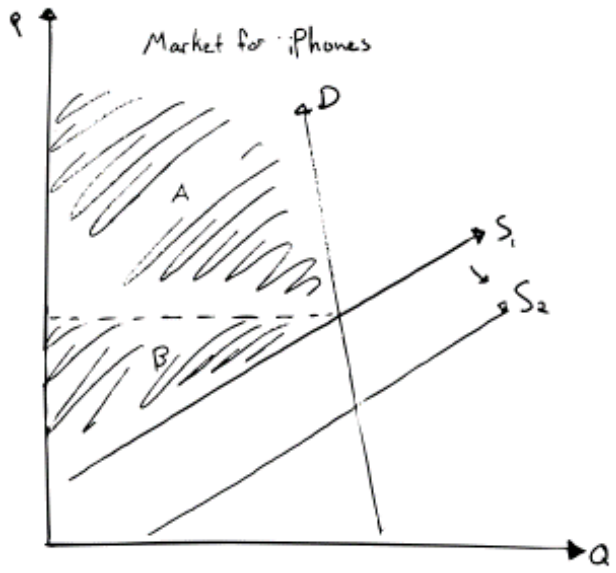

Figure 7: Market for iPhones

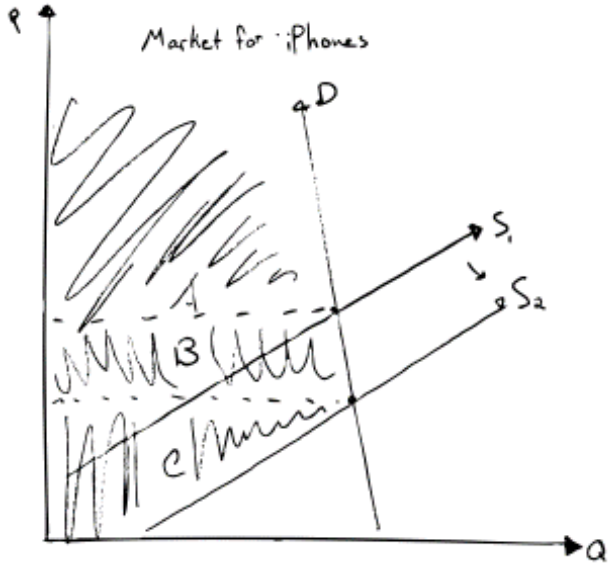

Figure 8: Change to surplus in the market for iPhones