Chapter 7 Practice Problem Solutions

Elements of Microeconomics - Section 4

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Question 1

Consider Figure 1 from chapter 7 in the textbook.

What is the auction price if there is only one record at auction?

Assume that another buyer, Yoko, enters the market and has a willingness to pay of $100. What happens to the auction price if there is still only one record at auction?

Answer

The auction price with one record at auction will be $80. This is because at this price, all three bidders except Taylor have dropped out because their willingness to pay is lower than the price being offered. So Taylor will pay $0 for the record.

When Yoko enters the market, the the auction price will rise to $100. This is because if Taylor bids $80, Yoko is willing to bid higher, let's say at $81. But if Yoko bids $81, then Taylor is willing to bid $82 as this is still lower than her willingness to pay. This continues until we reach $100.

Question 2

Consider the market for coffee and construct a graph of demand and supply for the market.

Part A

Draw the total surplus at the market equilibrium, identifying consumer surplus and producer surplus.
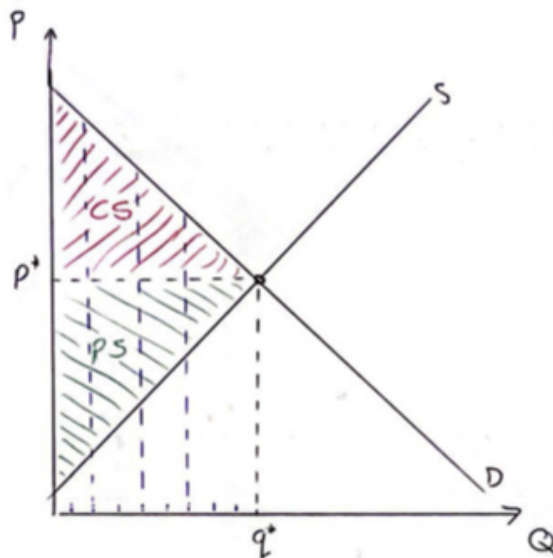
Part B (Bonus for later in semester)

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?

2. Identify graphically the change to consumer surplus?

3. Identify graphically the change to producer surplus?

4. Do we still have the same amount of total surplus in the market as we did previously?
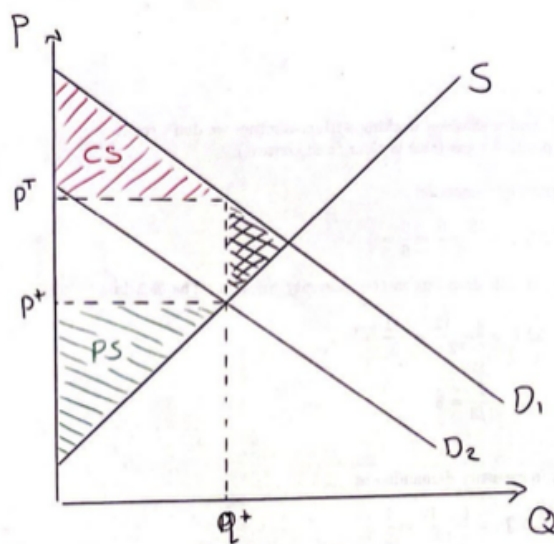
Consumer and producer surplus will both decrease as shown. The box below consumer surplus and above producer surplus will be tax revenue. However total surplus is still less than it was before without the tax.

Part C (Bonus for later in semester)

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.
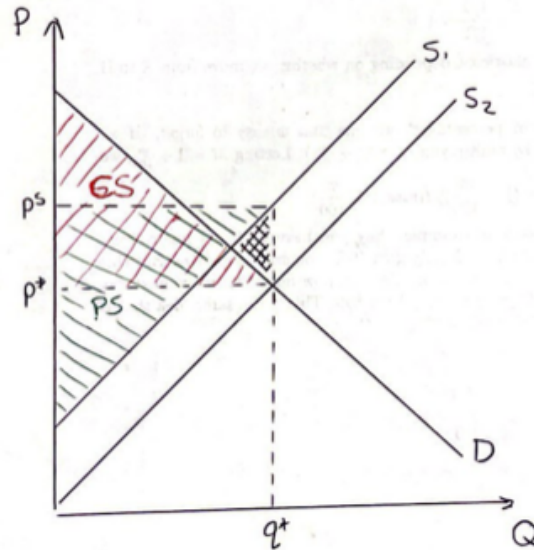
Question 3

Frank values his time at $70 per hour. He agrees to spend 4 hours helping Shane with his gardening. Shane has a total willingness to pay of $400 for Frank to do his gardening. They settle on a price of $350.

1. What is the value of the consumer surplus?

2. What is the value of the producer surplus?

3. Can any other price increase or decrease total surplus in the market?

Answer

1. Shane is willing to pay $400 but only plays $350 so his consumer surplus is $400-$350=$50

2. Frank values his 4 hours of time at $70 \cdot 4 = $280 but gets paid $350 so his producer surplus is $350-$280=$70

3. No. Other prices will only change how the surplus is distributed. For example, a price of $340 will distribute the producer and consumer surplus more equally at $60 each. However the total surplus is still the same at $120. Check for yourself that any price will produce $120 of surplus which is the difference between the two valuations of the consumer and producer.

Question 4

Consider a market where Victoria is selling bottles of water and Gerri is buying them. Their willingness to pay and costs to produce are given below.

	Victoria's value for a bottle	Gerri's cost to produce
1st bottle	$13	$1
2nd bottle	$10	$3
3rd bottle	$7	$5
4th bottle	$4	$7
5th bottle	$1	$9

1. What is the quantity demanded and quantity supplied at the prices $9, $6, and $3?

2. At which of these prices is there an equilibrium?

3. What are the consumer surplus, producer surplus, and total surplus in equilibrium?

4. What would happen to total surplus if Victoria consumed one less bottle of water and Gerri produced one fewer?

5. What would be the change to consumer producer, and total surplus at the original equilibrium price if Victoria's preferences for bottles of water increases such that shes willing to spend an additional $4 on every bottle of water?

6. What would the new equilibrium price and quantity be in the example above?

Answer

1. See table

Price	Q_D	Q_S
$9	2	5
$6	3	3
$3	4	2

4

2. $6

3. Consumer surplus = ($13 − $6) + ($10 − $6) + ($7 − $6) = $12

   Producer surplus = ($6 − $1) + ($6 − $3) + ($6 − $5) = $9

   Total surplus = Consumer surplus + Producer surplus = $12 + $9 = $21

4. Consumer surplus = ($13 − $6) + ($10 − $6) = $11

   Producer surplus = ($6 − $1) + ($6 − $3) = $8

   Total surplus = Consumer surplus + Producer surplus = $11 + $8 = $19

5. Producer surplus would not change as, at the original equilibrium price, Gerri will still only produce 3 bottles. Therefore producer surplus is $9. However, consumer surplus = ($17 − $6) + ($14 − $6) + ($14 − $6) = $24. Therefore, total surplus is now $33.

6. A price between $7 and $8, and 4 bottles is the new equilibrium. Given a price of $7, now consumer surplus = $22, producer surplus = $12, and total surplus = $34.