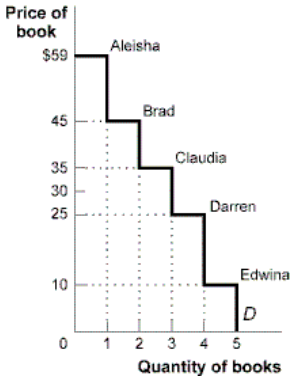
Consumer and Producer Surplus

Problem Set

Use the graph below to answer questions 1-2.



1. In the figure, when the price falls from $30 to $25, consumer surplus _____ for a total consumer surplus of _____.
   a. increases by $25; $74
   b. decreases by $15; $34
   c. increases by $15; $64
   d. increases by $5; $54
   e. increases by $15; $45

2. In the figure, total consumer surplus is _____ when the price is $10.
   a. $50
   b. $59
   c. $84
   d. $124
   e. $144

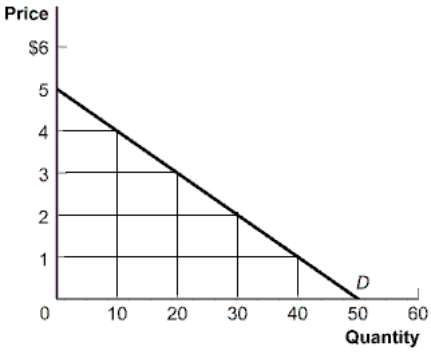
Use the table below to answer questions 3-4.

Student willingness to pay to see *The Nutty Nutcracker*, by the Atlanta Ballet.	
Student	Willingness to Pay
Lilly	$100
Ryan	$90
Cara	$65
Sundreana	$50
Pat	$15

3. If the price of a ticket to see The Nutty Nutcracker is $50, then Cara's consumer surplus is:
   a. $60.
   b. $50.
   c. $15.
   d. $240.
   e. $115.

4. If the price of a ticket to see The Nutty Nutcracker is $75 and there is no other market for tickets, the total consumer surplus for the five students is:
   a. $190.
   b. $125.
   c. $40.
   d. $0.
   e. $150.

Use the graph below to answer questions 5-6.



5. If the price of the good is $2, consumer surplus will equal:
   a. $30.
   b. $15.
   c. $60.
   d. $90.
   e. $45.

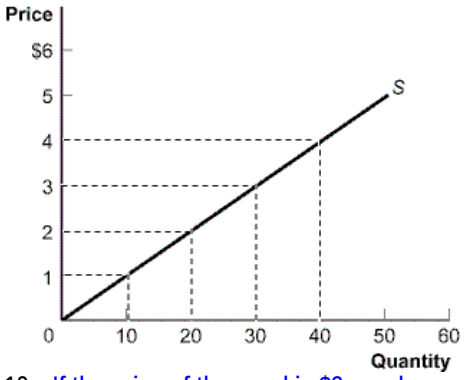
6. If the price of the good increases from $3 to $4, consumer surplus will decrease by:
   a. $5.
   b. $10.
   c. $15.
   d. $20.
   e. $25.

7. Consider the market for milkshakes. An increase in the consumer surplus may result from:
   a. an increase in the price of milkshakes.
   b. a price floor in the market for milkshakes.
   c. a decrease in the demand for milkshakes.
   d. a decrease in the supply of milkshakes.
   e. an increase in the supply of milkshakes.

8. Which of the following is true if there is a decrease in the demand for ice cream?
   a. There is an increase in producer surplus.
   b. There is a decrease in producer surplus.
   c. There is no change in producer surplus.
   d. There is an increase in consumer surplus.
   e. There is an increase in deadweight loss.

9. Mountain River Adventures offers white water rafting trips down the Colorado River. It costs the firm $100 for the first raft trip per day, $120 for the second, $140 for the third, and $160 for the fourth. If the market price for a raft trip is $150, Mountain River Adventures will offer _____ trips per day and will have producer surplus equal to _____.
   a. 3; $90
   b. 3; $10
   c. 2; $220
   d. 4; $80
   e. 3; $150

Use the graph below to answer questions 18-19.



10. If the price of the good is $2, producer surplus will equal:
    a. $20.
    b. $40.
    c. $60.
    d. $80.
    e. $100.

11. Peanut butter is an inferior good. If there is an increase in income, total surplus in the peanut butter market:
    a. will increase.
    b. will decrease.
    c. will not change.
    d. may change, but we cannot determine the change without more information.
    e. will rise to infinite levels.

Use the table below to answer questions 12-13.

Student willingness to sell tickets to *The Nutty Nutcracker*, by the Atlanta Ballet.	
Student	Willingness to Sell
Andrew	$1
Jean	$25
Kate	$60
Marsha	$90
Sarah	$100

12. If the price of a ticket to see The Nutty Nutcracker is $50, then Marsha's producer surplus is:
    a. $0.
    b. $40.
    c. $90.
    d. $140.
    e. $240.

13. If the price of a ticket to see The Nutty Nutcracker is $75, then Andrew's producer surplus is:
    a. $0.
    b. $74.
    c. $75.
    d. $100.
    e. $125.

14. Consider the market for cheese-stuffed jalapeno peppers. There are two consumers, Casey and Josey, and their willingness to pay for each pepper is given in the accompanying table. (Neither is willing to consumer more than 4 peppers at any price.) Use the table (i) to construct the demand schedule for peppers for prices of $0.oo, $0.10, and so on, up to $0.90, and (ii) to calculate the total consumer surplus when the price of a pepper is $0.40.

Quantity of Peppers Demanded	Casey's Willingness to Pay	Josey's Willingness to Pay
1	$0.90	$0.80
2	$0.70	$0.60
3	$0.50	$0.40
4	$0.30	$0.30

A consumer buys each pepper if the price is less than (or just equal to) the consumer's willingness to pay for that pepper. The demand schedule is constructed by asking how many peppers will be demanded at any given price. The accompanying table illustrates the demand schedule.

Price of a Pepper	Quantity of Peppers Demanded	Quantity of Peppers Demanded by Casey	Quantity of Peppers Demanded by Josey
$0.90	1	1	0
$0.80	2	1	1
$0.70	3	2	1
$0.60	4	2	2
$0.50	5	3	2
$0.40	6	3	3
$0.30	8	4	4

$0.20	8	4	4
$0.10	8	4	4
$0.00	8	4	4

When the price is 40.40, Casey's consumer surplus from the first pepper is $0.50, from his second pepper $0.30, from his third pepper $0.10, and he does not buy any more peppers. Casey's individual consumer surplus is therefore $0.90. Josey's consumer surplus from her first pepper is $0.40, from her second pepper $0.20, from her third pepper $0.00 (since the price is exactly equal to her willingness to pay, she buys the third pepper but receives no consumer surplus from it), and she does not buy any more peppers. Josey's individual consumer surplus is therefore $0.60. Total consumer surplus at a price of $0.40 is therefore $0.90 + $0.60 = $1.50.

15. Consider the market for cheese-stuffed jalapeno peppers. There are two producers, Cara and Jamie, and their costs of producing each pepper are given in the accompanying table. (Neither is willing to produce more than 4 peppers at any price.) Use the table (i) to construct the supply schedule for peppers for prices of $0.00, $0.10, and so on up to $0.90, and (ii) to calculate the total producer surplus when the price of a pepper is $0.70.

Quantity of Peppers Supplied	Cara's Cost	Jamie's cost
1	$0.10	$0.30
2	$0.10	$0.50
3	$0.40	$0.70
4	$0.60	$0.90

A producer supplies each pepper if the price is greater than (or just equal to) the producer's cost of producing that pepper. The supply schedule is constructed by asking how many peppers will be supplied at any price. The accompanying table illustrates the supply schedule.

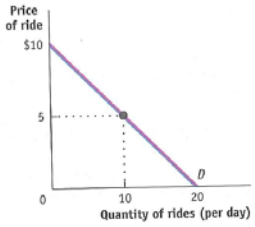
Price of a Pepper	Quantity of Peppers Supplied	Quantity of Peppers Supplied by Cara	Quantity of Peppers Supplied by Jamie
$0.90	8	4	4
$0.80	7	4	3
$0.70	7	4	3
$0.60	6	4	2
$0.50	5	3	2
$0.40	4	3	1
$0.30	3	2	1
$0.20	2	2	0
$0.10	2	2	0
$0.00	0	0	0

When the price is $0.70, Cara's producer surplus from the first pepper is $0.60, from her second pepper $0.60, from her third pepper $0.30, from her fourth pepper $0.10, and she does not supply any more peppers. Cara's individual producer surplus is therefore $1.60. Jamie's producer surplus from his first pepper is $0.40, from his second pepper $0.20, and from his third pepper $0.00 (since the price is exactly equal to his cost, he sells the third pepper but receives no producer surplus from it), and he does not supply any more peppers. Jamie's individual producer surplus is therefore $0.60. Total producer surplus at a price of $0.70 is therefore $1.60 + $0.60 = $2.20.

16. Using the tables in problems #1 and #2, find the equilibrium price and quantity in the market for cheese-stuffed jalapeno peppers. What is the total surplus in the equilibrium in this market, and who receives it?

The quantity demanded equals the quantity supplied at a price of $0.50, the equilibrium price. At that price, a total quantity of five peppers will be bought and sold. Casey will buy three peppers and receive consumer surplus of $0.40 on his first, $0.20 on his second, and $0.00 on his third pepper. Josey will buy two peppers and receive consumer surplus of $0.30 on her first and $0.10 on her second pepper. Total consumer surplus is therefore $1.00. Cara will supply three peppers and receive producer surplus of $0.40 on her first, $0.40 on her second, and $0.10 on her third pepper. Jamie will supply two peppers and receive producer surplus of $0.20 on his first and $0.00 on his second pepper. Total producer surplus is therefore $1.10. Total surplus in this market is therefore $1.00 + $1.10 = $2.10.

17. You are the manager of Fun World, a small amusement park. The accompanying diagram shows the demand curve of a typical customer at Fun World.



a. Suppose that the price of each ride is $5. At that price, how much consumer surplus does an individual consumer get?

From the demand curve, you can see that with a price per ride of $5, the customer takes 10 rides. At this point her consumer surplus is 1/2 X ($10 - $5) X 10 = $25.

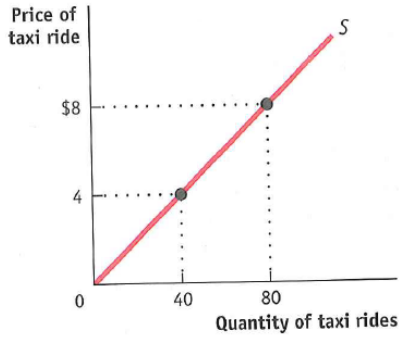
b. Suppose that Fun World considers charging an admission fee, even though it maintains the price of each ride at $5. What is the maximum admission fee it could charge? (Assume that all potential customers have enough money to pay the fee.)

Since a consumer obtains consumer surplus of $25 from going to Fun World when each ride costs $5, that is the most that she would be willing to pay to go there. And it is therefore the maximum admission fee that Fun World could charge. (Charging consumers both an entrance fee and a price for each unit of a good bought is called a *two-part tariff*.)

c. Suppose that Fun World lowered the price of each ride to zero. How much consumer surplus does an individual consumer get? What is the maximum admission fee Fun World could charge?

If Fun World charged nothing for each ride, a typical consumer would consume 20 rides, and this would give her a consumer surplus of 1/2 X $10 X 20 = $100. This is the maximum admission fee that Fun World can charge with a price per ride of zero.

18. The accompanying diagram illustrates a taxi driver's individual supply curve. (Assume that each taxi ride is the same distance.)



a. Suppose the city sets the price of taxi rides at $4 per ride, and at $4 the taxi driver is able to sell as many taxi rides as he desires. What is this taxi driver's producer surplus?

At a price of $4, the taxi driver supplies 40 rides. His producer surplus is therefore 1/2 X $4 X 40 = $80.

b. Suppose that the city keeps the price of a taxi ride set at $4, but it decides to charge taxi drivers a "licensing fee." What is the maximum licensing fee the city could extract from this taxi driver?

Since the taxi driver's producer surplus is $80, this is the most he is willing to pay to supply 40 rides at $4. So it is the most the city can charge him as a licensing fee.

c. Suppose that the city allowed the price of taxi rides to increase to $8 per ride. Again assume that, at this price, the taxi driver sells as many rides as he is willing to offer. How much producer surplus does an individual taxi driver now get? What is the maximum licensing fee the city could charge this taxi driver?

At a price of $8, the taxi driver supplies 80 rides, making his producer surplus 1/2 X $8 X 80 = $320. So $320 is the most the city can charge as a licensing fee when the price per ride is $8.