

**Economics 101**  
**Fall 2011**  
**Answers to Homework #2**  
**Due 9/27/2011**

**Directions:** The homework will be collected in a box **before** the lecture. Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade. Please remember the section number for the section **you are registered**, because you will need that number when you submit exams and homework. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

**Please realize that you are essentially creating “your brand” when you submit this homework. Do you want your homework to convey that you are competent, careful, professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!**

1. Below is a demand schedule for tickets to The Orpheum, Madison, for a performance of *Les Miserables*.

Price per ticket (\$)	Quantity demanded (no. of tickets)
56	3,000
60	2,800
64	2,600
68	2,400
72	2,200
76	2,000
80	1,800

- a. If the Orpheum has a seating capacity of 2,400 seats and if it sets a price of \$72 per ticket, will there be a shortage or surplus of seats available?

**Answer:** From the demand schedule, we see that the quantity demanded at the price of \$72 is 2200 seats. Since there are 2400 seats available, there is in fact a surplus of seats available.

- b. What will happen to the price of tickets to this event if free market forces were allowed to operate?

**Answer:** Since there is a surplus of seats, market forces would place downward pressure on the price of tickets. The organizers of the performance would lower ticket prices to attract a larger audience. From the demand schedule, we see that quantity demand equals 2400 seats when price is at \$68.

- c. What is the equilibrium price of a ticket for this performance?

Answer: As seen from part (b), the equilibrium price for a ticket will be \$68 since quantity demanded equals quantity supplied at that point. That is, demand and supply intersect when price is \$68 and quantity is 2400.

- d. Describe the short-run supply curve for tickets to this performance.

Answer: The supply curve is a vertical line at 2400 seats. In the short-run the theater has no way of increasing its seating capacity.

- e. In anticipation of the next performance, the theater underwent extensive renovation and expanded their seating capacity to 3000. Describe the new supply curve and compare it to the initial supply curve.

Answer: The new supply curve would be 600 units to the right of the initial supply curve, at 3000 units. It would again be a perfectly vertical line.

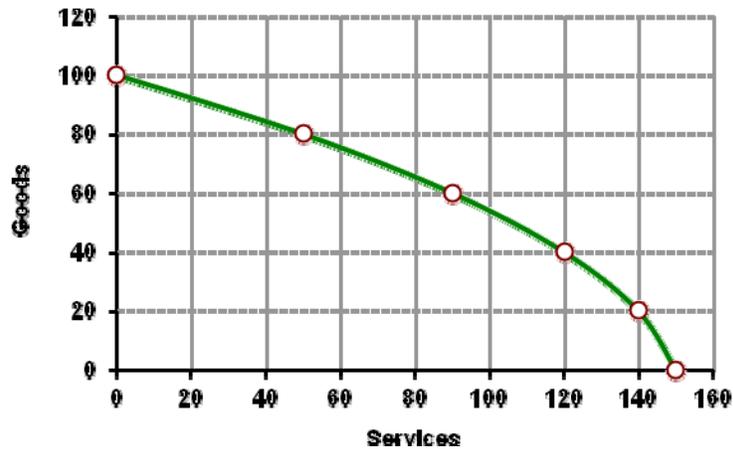
- f. Assuming the demand schedule remains the same, what would be the new equilibrium price after the renovation of the theater?

Answer: From the demand schedule, the new equilibrium price would be \$56.

2. A country is capable of producing the following combinations of goods and services per period of time, assuming that it makes full use of its resources.

Goods (units)	100	80	60	40	20	0
Services (units)	0	50	90	120	140	150

- a. Draw the production possibility curve for this country.



Answer: The curve shows all the possible combinations of two goods that a country can produce within a given time period. If a country was fully using its resources, then it would produce somewhere on the curve. If there was unemployment or under-utilisation of one or more factors of production, the country would be producing inside the curve. The country could not produce beyond the curve.

b. Is it possible for this country to produce the following combinations of goods and services?

- |   |                 |
|---|-----------------|
| (i) 80 units of goods and 50 units of services    | <i>Yes / No</i> |
| (ii) 70 units of goods and 90 units of services   | <i>Yes / No</i> |
| (iii) 40 units of goods and 100 units of services | <i>Yes / No</i> |

Answer:

- (i) **Yes** (on the curve)
- (ii) **No** (outside the curve)
- (iii) **Yes** (inside the curve)

c. What is the opportunity cost (in terms of services) of producing 20 extra units of goods when this country is initially producing:

- (i) 60 units of goods
- (ii) 20 units of goods

Answer:

- (i) **40 units of services (90–50)**
- (ii) **20 units of services (140–120)**

Here, the opportunity cost of producing more goods is the reduction in the production of services that this entails. In the case of (i), producing an extra 20 units of goods would mean that production was now at 80 units. From the table, and the curve, you can see that this will allow a maximum of 50 units of services to be produced. Thus production of services has fallen from a maximum of 90 to a maximum of 50 units: a fall of 40 units. Thus 40 units of services is the opportunity cost. In the case of (ii), moving from producing 20 units of goods to 40 units means moving from 140 units of services to 120 units: an opportunity cost of 20 units of services.

3. Referring back to question 2, assume now that technological progress allows a four-fold increase in the output of goods and double the amount of services for any given amount of resources.

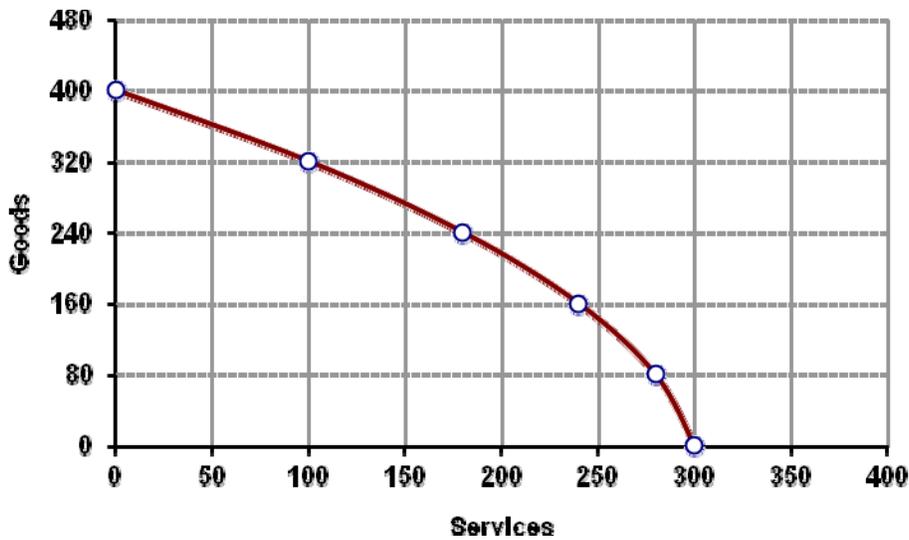
a. Assuming that the country's total amount of resources stays the same, fill in the new figures on the following table to show the new production possibilities.

Goods (units)						
Services (units)						

**Answer:**

Goods (units)	<b>400</b>	<b>320</b>	<b>240</b>	<b>160</b>	<b>80</b>	<b>0</b>
Services (units)	<b>0</b>	<b>100</b>	<b>180</b>	<b>240</b>	<b>280</b>	<b>300</b>

b. Draw the new production possibility curve.



- c. .... H
- ow has this technological progress affected the opportunity cost of a unit of goods?
- Stays the same.
  - Doubles.
  - Halves.
  - Increases four times.
  - Decreases four times.

Answer:

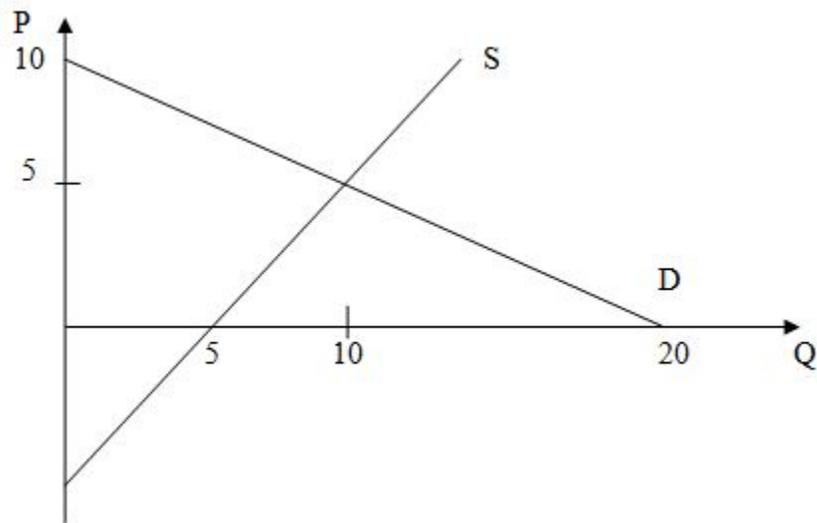
C. Halves.

If you can produce four times as many units of goods and twice as many units of services with a given amount of resources, then, as production moves from services to goods, only half as many units of services will need to be sacrificed for each extra unit of goods (compared with the situation before the technological progress).

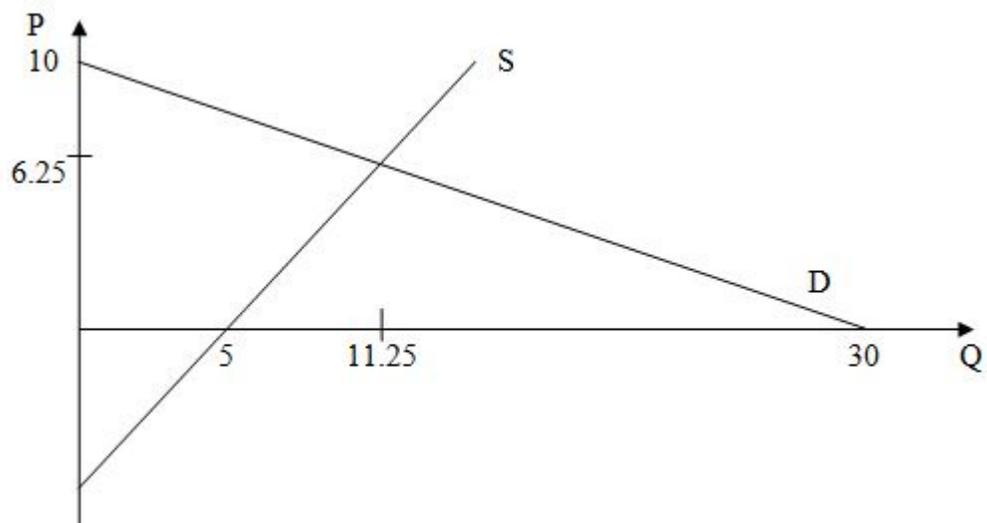
- Let Romeo's demand curve for cheese curds be  $Q_{d1}=20-2P$ , where  $Q_{d1}$  is the quantity demanded of cheese curds, and Juliet's demand curve for cheese curds is  $Q_{d2}=30-3P$ , where  $Q_{d2}$  is the quantity demanded of cheese curds. The market supply curve for cheese curds is given by  $Q_s=P+5$ .
  - Graph Romeo's demand curve. Graph Juliet's demand curve on a separate graph. Graph the market supply curve on each of the separate graphs.
  - Suppose Romeo is the only consumer of cheese curds. Calculate the equilibrium price and quantity for cheese curds.
  - Now on a new graph, graph the market demand curve for cheeses curds by horizontally summing Romeo and Juliet's demand curves. Also graph the market supply curve.
  - What is the market demand function for cheese curds if Romeo and Juliet are the only consumers of cheese curds in this market? What is the equilibrium price and

quantity in the market for cheese curds?

a. Romeo's demand curve with market supply curve



Juliet's demand curve with market supply curve



b. In the market equilibrium, the quantity demanded equals the quantity supplied. Since Romeo is the only consumer in the market, his quantity demanded equals the quantity supplied, that is,  $Q_{d1}=Q_s$ . To find the market equilibrium price:

$$20 - 2P = P + 5$$

Add  $2P$  to both sides,

$$20 = 3P + 5$$

Subtract 5 from both sides,

$$15 = 3P$$

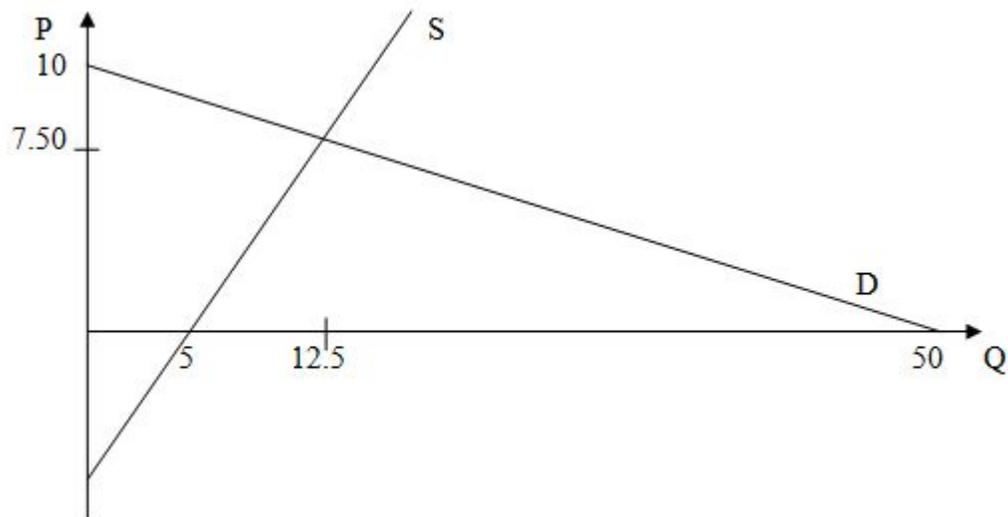
Divide both sides by 3,  
 $P = 5$

So the market equilibrium price is 5. By plugging this into either the demand equation for Romeo or the supply equation for the producer, we arrive at the equilibrium quantity:

$$Q = 20 - 2(5) = 5 + 5$$
$$Q = 20 - 10 = 10$$

Therefore the market equilibrium price and quantity for cheese curds when Romeo is the only consumer is  $P=5$ ,  $Q=10$ .

c. Market Demand and Supply Curves



- d. By summing the demand curves of Romeo and Juliet, we get the new market demand curve to be:  $Q_d = 20 - 2P + 30 - 3P = 50 - 5P$  since both demand curves operate at the same price levels, that is, when  $P=10$ , both Romeo and Juliet desire 0 cheese curds. Once again to find the market equilibrium, we set the quantity demanded equal to the quantity supplied, solve for price, and plug that value into either supply or demand curve to get our equilibrium quantity. So  $Q_d = Q_s$ , which means,

$$50 - 5P = P + 5$$

Add  $5P$  to both sides,

$$50 = 6P + 5$$

Subtract 5 from both sides,

$$45 = 6P$$

Divide both sides by 6

$$P = (45/6) = (15/2) = 7.5$$

Then we find the equilibrium quantity by plugging this P into either the market demand curve or the market supply curve to get:

$$Q = 50 - 5(15/2) = (15/2) + 5$$

$$Q = (100 - 75)/2 = (15 + 10)/2$$

$$Q = (25/2) = 12.5$$

5. Imagine a tiny world with only two countries, A and B. These two countries both believe in frugal living and produce only wheat or cloth, to cover their basic needs of food and clothing. Below is a table describing their ability to produce these goods:

Country \ Good	1 unit of resource can produce	
	Wheat (units)	Cloth (units)
A	10	or 20
B	20	or 5

- a. Which country has the absolute advantage in each commodity?  
 Country A has absolute advantage over Country B in cloth while Country B has the absolute advantage in wheat. Country B can produce 2 times as much wheat as Country A can. Country A can produce 4 times as much cloth as Country B can.
- b. Where are the comparative advantages for A and B?

Answer:

Country A has a greater relative efficiency or *lower opportunity cost* in cloth than in wheat production.

In Country A		In Country B	
1 unit of wheat	: 2 units of cloth	1 unit of wheat	: ¼ unit of cloth
1 unit of cloth	: ½ unit of wheat	1 unit of cloth	: 4 units of wheat

To produce 1 unit of wheat, Country B sacrifices less cloth (incurs lower opportunity cost) than Country A does. Thus, B is said to have comparative advantage in wheat production.

To produce 1 unit of cloth, Country A sacrifices less wheat (incurs lower opportunity cost) than Country B does. Therefore, A is said to have comparative advantage in cloth production.

- c. Make the following assumptions and fill in the table showing the production (and therefore consumption) of the two countries under autarky (without specialization and trade). Assume that
- (a) each country has 2 units of resources

- (b) each country uses 1 unit of resource for each commodity  
(c) full employment of resources exists

**Table 1 Production and consumption before specialisation**

Country \ Good	Wheat (units)	Cloth (units)
A		
B		
<b>World (Total)</b>		

**Answer:**

**Table 1 Production and consumption before specialisation**

Country \ Good	Wheat (units)	Cloth (units)
A	10	20
B	20	5
<b>World (Total)</b>	<b>30</b>	<b>25</b>

- d. Now consider what happens *after* the two countries specialize (assume the above assumptions are still true):

**Table 2 Production after specialisation**

Country \ Good	Wheat (units)	Cloth (units)
A		
B		
<b>World (Total)</b>		

**Answer:**

**Table 2 Production after specialisation**

Country \ Good	Wheat (units)	Cloth (units)
A	0	40
B	40	0

<b>World (Total)</b>	<b>40</b>	<b>40</b>
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With **specialization**, world **production of both cloth and wheat has increased**. Comparing Tables 1 and 2, wheat has increased by 10 units and cloth by 15 units.

- e. Calculate the range of the terms of trade under which both countries would willingly enter into trade.

<b>In Country A</b>	<b>In Country B</b>
1 unit of wheat : 2 units of cloth	1 unit of wheat : ¼ unit of cloth
1 unit of cloth : ½ unit of wheat	1 unit of cloth : 4 units of wheat

Under autarky, if Country A wished to consume 1 unit of wheat, it would need to give up 2 units of cloth. We see then that under trade and specialization, the price of wheat,  $P_w$ , is at most 2 units of cloth (Country A is not worse off than before):  **$P_w \leq 2$  units of cloth**. In other words, Country A would sell 1 unit of cloth for no less than ½ a unit of wheat:  **$P_c \geq \frac{1}{2}$  unit of wheat**.

Under autarky, Country B would need to give up 4 units of wheat in order to consume 1 unit of cloth. Therefore, under trade and specialization, the price of cloth,  $P_c$  must be at most 4 units of wheat:  **$P_c \leq 4$  units of wheat**. Further, Country B would sell 1 unit of wheat for no less than ¼ a unit of cloth:  **$P_w \geq \frac{1}{4}$  unit of cloth**.

Putting these four inequalities together, we obtain:

$$\frac{1}{4} \text{ unit of cloth} \leq P_w \leq 2 \text{ units of cloth}$$

$$\frac{1}{2} \text{ unit of wheat} \leq P_c \leq 4 \text{ units of wheat}$$

Terms of trade falling within this set of inequalities would lead to **both** countries gaining from specialization and trade with one another. Note that both countries specialize according to their comparative advantage.

6. Explain how supply and demand shift given the following situations (You may use graphs in your explanations). What do we know about the new equilibrium price and quantity (increased, decreased, stays the same, don't know for sure)?

- a. McDonalds opened up twelve new stores in New York. What happens to the market for McDonald meals?

**Answer:**

**Supply shifts to the right, which results in a decrease in the equilibrium price and an increase in the quantity of meals.**

- b. There is a dramatic increase in the price of teapots. What happens in the market for tea?

Answer: Since teapots and tea are complements, the demand for tea would decrease due to the increase in the price of teapots. Hence, the demand curve for tea would shift to the left, and the price and quantity of tea in equilibrium would decrease.

- c. Everyone in the country receives a stimulus package from the government, but a hurricane destroyed several manufacturing plants. What happens in the general market for manufactured goods?

Answer: The stimulus package would raise income hence causing a rightward shift in demand. Supply, on the other hand, would shift to the left due to the destruction of the plants. Both shifts lead to an upward pressure on price, hence equilibrium price would increase. However, since the shift in supply places downward pressure on quantity, whereas the rightward shift in demand places upward pressure on quantity, the new equilibrium quantity is indeterminate.