

Problem Set 1 Solutions to Problems 3, 4, 5, and 6

Problem 3

Given:

P	Supply	Demand
\$3.80	1500	525
\$3.70	1000	600
\$3.60	700	700
\$3.50	600	900
\$3.40	550	1200

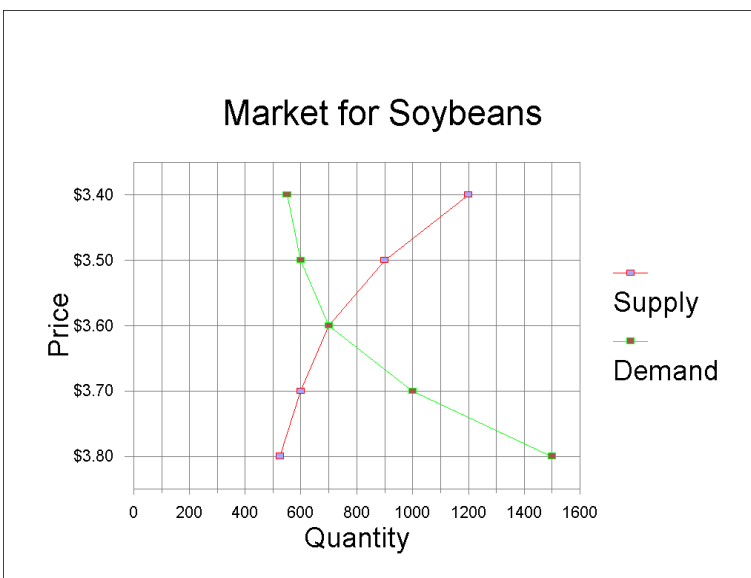
3a. Is there excess demand or excess supply when the price is \$3.80? When the price is \$3.40?

At \$3.80, $Q_S = 1500 > 525 = Q_D$ so there is excess supply. At \$3.40, $Q_S = 550 < 1200 = Q_D$ so there is excess demand.

3b. Find the equilibrium price and the equilibrium quantity.

At \$3.60, $Q_S = 700 = Q_D$ so the equilibrium price is \$3.60 and the equilibrium quantity is 700.

3c. Graph the supply and demand curves.



3d. Show how the equilibrium price and quantity can be found on the graph.

The equilibrium is the intersection. Draw a horizontal dotted line to get the equilibrium price and a vertical dotted line to get the equilibrium quantity.

3e. Suppose that a severe drought in Brazil destroys Brazil's entire crop of 400 bushels of soybeans. Find the new equilibrium price and quantity.

The intent of this question is to have a leftward shift of supply by 400 at each price. The supply schedule would be adjusted to:

P	New Supply	Demand
\$3.80	1100	525
\$3.70	600	600
\$3.60	300	700
\$3.50	200	900
\$3.40	150	1200

We can see that the new equilibrium is at price \$3.70 and 600 quantity.

Problem 4

Suppose one of your friends offered the following argument:

“An increase in demand will cause an increase in price. The increase in price will cause an increase in supply that will cause an offsetting decrease in price. Therefore, it is impossible to tell what effect an increase in demand will have on price.”

Do you agree with your friend? If you disagree, what is wrong with your friend's reasoning?

You should disagree. The flaw in the logic comes at the start of the second sentence. An increase in price does not cause a rightward shift of the entire supply curve; an increase in price will only increase quantity supplied.

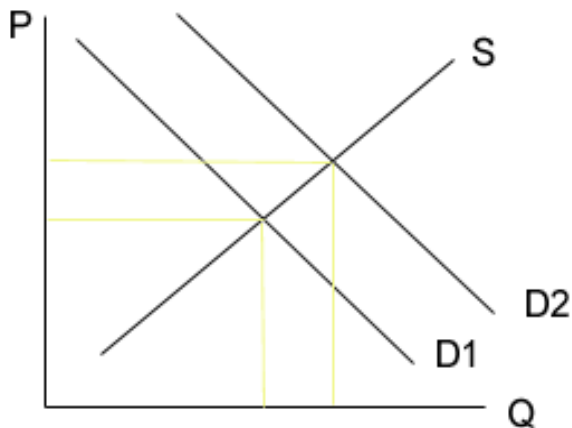
Problem 5

The price of fish and the quantity of fish sold have both risen in recent years. Does this mean that the demand curve of fish is upward sloping? Use a diagram to illustrate your answer.

This question is asking if the following logic statement is true or false:

If both price and quantity increase over time, the demand curve must be upward sloping.

That logic statement is false. Since the statement claims that all situations of increased price and quantity must be the result of an upward sloping demand curve, all we need to do is show one counterexample. Here is one such counterexample using a downward sloping demand curve:



Suppose the demand for fish was shifting right over time from D1 to D2. This could be due to people liking fish more or if fish was a normal good and budgets were rising. Both equilibrium quantity and equilibrium price are rising each time the demand curve shifts out.

Problem 6

Use supply and demand diagrams to explain what happens to the equilibrium price and the equilibrium quantity in the butter market in each of the following cases:

6a. The price of margarine falls.

Margarine is a substitute for butter. If a substitute is cheaper, consumers will buy less butter and more of the substitute. The demand curve for butter shifts left, so P and Q decrease.

6b. The price of bread falls.

Bread is a complement for butter. If a complement is cheaper, consumers will buy more butter to go with the complement. The demand curve for butter shifts right, so P and Q increase.

6c. Household incomes rise and butter is a normal good.

As income rises, consumers buy more of a normal good at every price. The demand curve for butter shifts right, so P and Q increase.

6d. The New England Journal of Medicine publishes a widely cited report that says people who consume a great deal of butter are more likely to have heart attacks.

People will consume less butter since they don't want heart attacks. This is equivalent to a change in people's preferences/tastes. The demand curve for butter shifts left, so P and Q decrease.

6e. The price of milk butter makers use to produce butter rises.

Producers supply less butter at every price if their production costs increase. The supply curve for butter shifts left, so P increases and Q decreases.

6f. The government places a 10 cent tax on each pound of butter produced.

This is equivalent to a 10 cent increase in the cost of producing butter. Producers supply less butter at every price if their production costs increase. The supply curve for butter shifts left, so P increases and Q decreases.

6g. The government offers a 10 cent subsidy on each pound of butter produced.

This is equivalent to a 10 cent reduction in the cost of producing butter. Producers supply more butter at every price if their production costs decrease. The supply curve for butter shifts right, so P decreases and Q increases.

(For all of Problem 6, I assumed that demand is downward sloping and supply is upward sloping)