

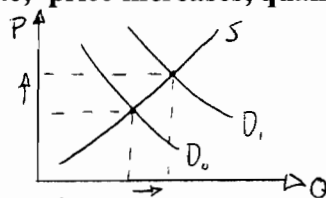
PRINCIPLES OF MICROECONOMICS (ECON 1101 SECTION 056)

ASSIGNMENT #1

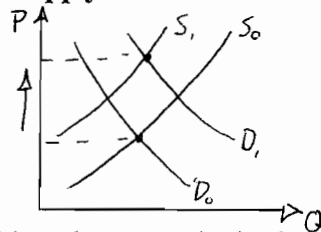
Answer Key

1. Consider the statewide market for maple syrup. For each of the following situations indicate: (1) whether supply, demand or both shift, (2) what type of shift each is, (3) in which direction each shift is, and (4) what the effect on equilibrium price and quantity is. (Hint: Draw graphs to find the effect on price and quantity.)

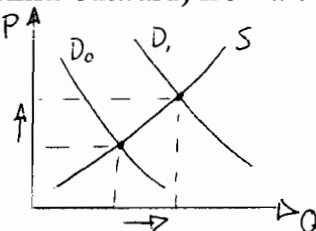
- (a) A fungal blight strikes blueberries and sends the price of jam to a record high. (8 points)  
**Supply in the jam decreases sending jam prices higher. Assuming jam and maple syrups are substitutes, demand for syrup will increase (shift outward) from the increase in a price of substitute; price increases, quantity increases.**



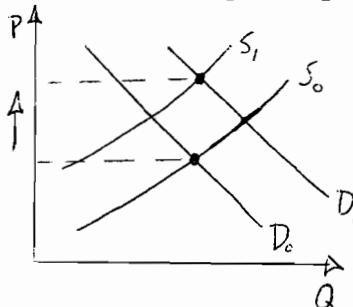
- (b) Retirement resorts in northern Minnesota expand rapidly, raising the population and buying out and demolishing several large syrup operations. (8 points)  
**Supply decreases (shifts inward) from change in the size of the industry, demand increases (shifts outward) from change in population; price increases, quantity change depends on slopes of supply and demand.**



- (c) A popular cable cooking show convincingly promotes maple syrup as a replacement for refined sugar in most recipes. (8 points)  
**Demand increases (shifts outward) from a change in preferences; price increases, quantity increases.**

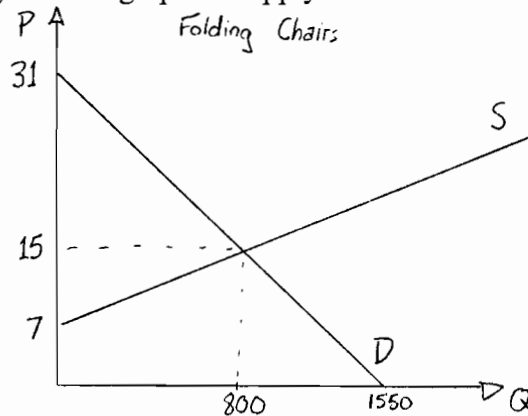


- (d) Food scientists develop a more efficient process for making pancake mix, and the price of pancake mix falls. At the same time, labor costs rise in Minnesota forests after more workers enter tourism-related industries. (8 points)  
**Demand increases (shifts outward) from a change in the price of a complement, supply decreases (shift inward) from a change in input prices; price increase, quantity change depends on slopes.**



2. The market for folding chairs has demand described by  $P=31-Q/50$  and supply described by  $P=7+Q/100$ .

(a) Draw a fully labeled graph of supply and demand in this market. (8 points)



(b) Calculate the equilibrium price and quantity. (12 points)

First, equate prices:  $31 - Q/50 = P = 7 + Q/100$

Next, solve for Q:  $24 - Q/50 = Q/100$

$$24 = 3Q/100$$

$$2400 = 3Q$$

$$\mathbf{Q=800}$$

Plug  $Q=800$  into the supply or demand to find P:

$$P=31-800/50 = 31-16 = \mathbf{15=P}$$

$$\text{Or } P=7+800/100 = 7 + 8 = \mathbf{15=P}$$

3. The market for recumbent bicycles in Minneapolis has demand described by  $P=2300-30Q$  and supply described by  $P=600+4Q$ .

(a) Calculate the equilibrium price and quantity. (10 points)

$$2300-30Q = 600+4Q$$

$$1700-30Q = 4Q$$

$$1700 = 34Q$$

$$\mathbf{Q=50}$$

$$\text{(using demand) } P = 2300-30*50 = 2300-1500 = \mathbf{800=P}$$

$$\text{(using supply) } P = 600 + 4*50 = 600+200 = \mathbf{800=P}$$

For parts b,c, and d, assume regulators impose a price ceiling of 700.

(b) Calculate the quantity demanded at the new price. (5 points)

From demand:  $P=2300-30Q$ , so when  $P=700$ ,  $700=2300-30Q$ . Thus  $Q^d=1600/30=\mathbf{53.33}$ .

(c) Calculate the quantity supply at the new price. (5 points)

From supply:  $P=600+4Q$ , so when  $P=700$ ,  $700=600+4Q$ . Thus  $Q^s=100/4=\mathbf{25}$

(d) State whether a surplus or a shortage arises and calculate the magnitude. (5 points)

**Shortage of  $53.3 - 25 = 28.33$**

4. The market for purebred dachshunds has demand described by  $P=250-Q$  and supply described by  $P=10+3Q$ .

(a) Calculate the equilibrium price and quantity. (9 points)

$$\begin{aligned}250-Q &= 10+3Q \\240-Q &= 3Q \\240 &= 4Q \\Q &= 60\end{aligned}$$

$$\begin{aligned}(\text{using demand}) P &= 250-60 = \mathbf{190=P} \\(\text{using supply}) P &= 10+3 \cdot 60 = 10+180 = \mathbf{190=P}\end{aligned}$$

(b) Calculate the price ceiling that would limit the number of dachshund sales to 25. (7 points)

**During a binding price ceiling, quantity exchanged is determined by supply. So, plug  $Q=25$  into the supply function. Thus,  $P=10+3 \cdot 25=85$  is the price ceiling.**

(c) Calculate the price floor that would limit the number of dachshund sales to 25. (7 points)

**During a binding price floor, quantity exchanged is determined by demand. So, plug  $Q=25$  into the demand function. Thus,  $P=250-25=225$ .**