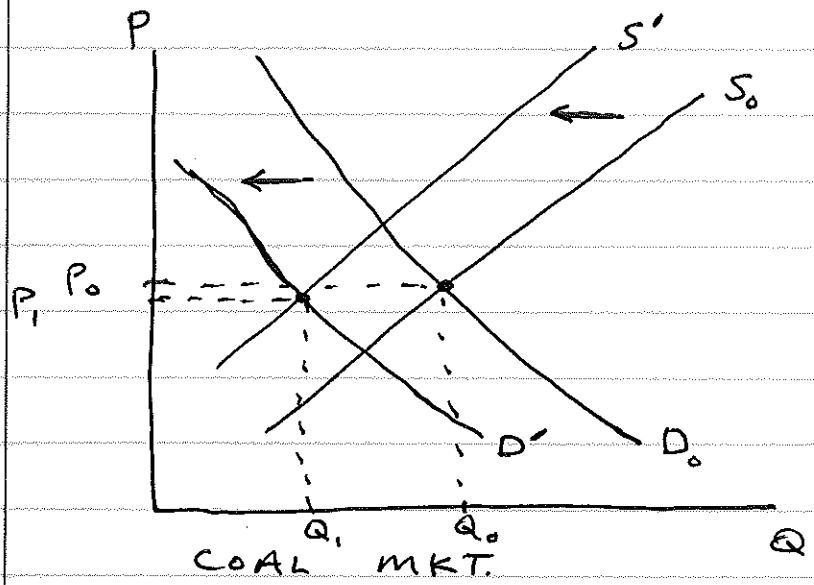
ECO 401 Problem Set #1 KEY Spring 2013

1.



- EPA regulations increase the cost of producing coal, causing supply curve to shift left.
- drop in price of natural gas (a substitute for coal) causes demand curve to shift left.
- decrease in supply leads to higher P and lower Q; decrease in demand leads to lower P and lower Q.
- Hence we can say for certain that equilibrium quantity will fall, but equilibrium price may rise, stay the same, or fall, depending on the relative shifts in D and S.

2. $Q_D = 600 - 2P$

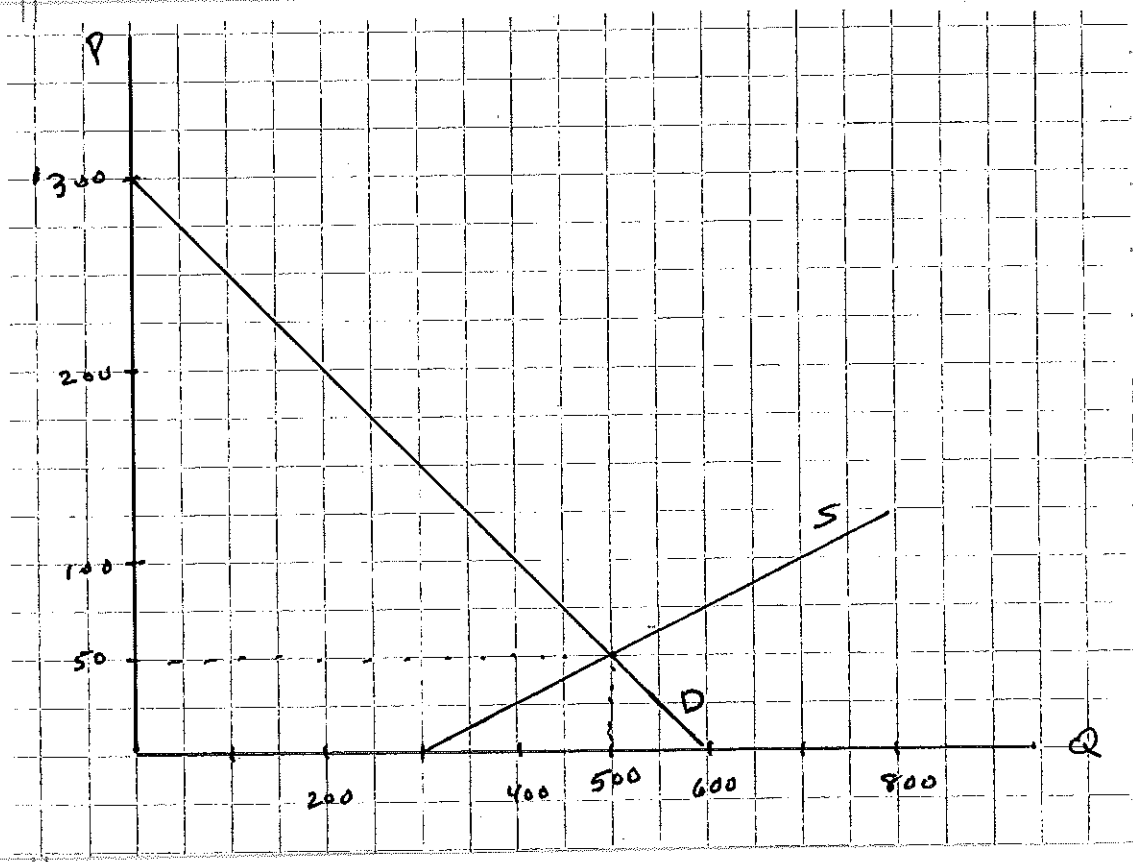
$Q_S = 300 + 4P$

at equilibrium, $Q_D = Q_S$:

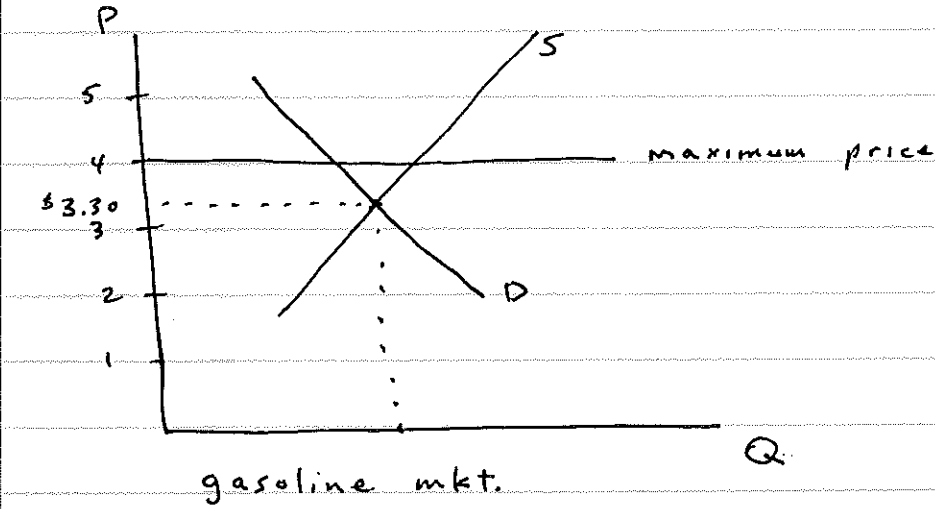
$600 - 2P = 300 + 4P$

$300 = 6P$

$P^* = 50$, $Q^* = 500$



3.



A price ceiling set above the market equilibrium price will have <u>no effect</u>. At $P = \$4$ per gallon, Q_S exceeds Q_D, so price will fall. At $P = \$3.30$, $Q_S = Q_D$.

On the other hand, if the price ceiling were set below the market-clearing price, it would create a shortage.

4. (a) arc price elasticity ⇒

$$n = \frac{\frac{\Delta Q}{\frac{1}{2}(Q_0 + Q_1)}}{\frac{\Delta P}{\frac{1}{2}(P_0 + P_1)}}$$

$$n = \frac{\frac{2}{\frac{1}{2}(61+63)}}{\frac{1}{\frac{1}{2}(111+110)}} = \frac{2/62}{1/110.5} = 3.56$$

(b) cross-price elasticity ⇒

$$\varepsilon_{x,P_y} = \frac{\frac{\Delta X}{\frac{1}{2}(X_0 + X_1)}}{\frac{\Delta P_y}{\frac{1}{2}(P_y^0 + P_y^1)}}$$

$$\varepsilon_{x,P_y} = \frac{\frac{(70-62)}{\frac{1}{2}(70+62)}}{\frac{111-110}{\frac{1}{2}(111+110)}} = \frac{8/66}{1/110.5} = 13.39$$

Eco 401-002, 003
Spring 2013
Problem Set #1

Due Monday, 1/21/13.

1. Coal and natural gas are two primary sources of energy for generating electricity in the U.S. The past several years have been hard on the coal industry. The U.S. Environmental Protection Agency has imposed severe restrictions on coal mining, adding to the costs of extracting coal from the ground. Technological advancements in natural gas production have caused the price of natural gas to drop sharply. Illustrate the effects of these two changes on the market for **coal**. Explain briefly whether you can say with certainty what will happen to the equilibrium price of coal and the equilibrium quantity of coal.

2. The demand and supply curves for coffee are given by:
   $Q_d = 600 - 2P$
   $Q_s = 300 + 4P$
   Plot the supply and demand curves on a graph and show where equilibrium occurs. Then, using algebra, solve for the equilibrium price and quantity and verify that they correspond to your graph.

3. Currently the market price of gasoline is $3.30 per gallon in Lexington. Suppose city council votes to make it illegal for any gasoline retailer to sell at a price higher than $4.00 per gallon, i.e. they impose a price ceiling or maximum price at $4. Illustrate and explain what the effect of this policy will be on the market for gasoline.

4. Southeast Airlines and Jet Purple are the only two airlines serving the Pikeville-Paducah city pair market. You collect the following data on the prices charged by each airline and the number of passengers flying on each:

Month	SE Price	JP Price	SE passengers	JP passengers
1	109	111	70	61
2	109	110	62	63

   a) Calculate the own-price elasticity of demand for air travel on Jet Purple. Show the formula you use and the numbers you use to perform the calculation.
   b) Calculate the cross-price elasticity between JP's price and SE's passenger load. Show the formula you use and the numbers you use to perform the calculation.