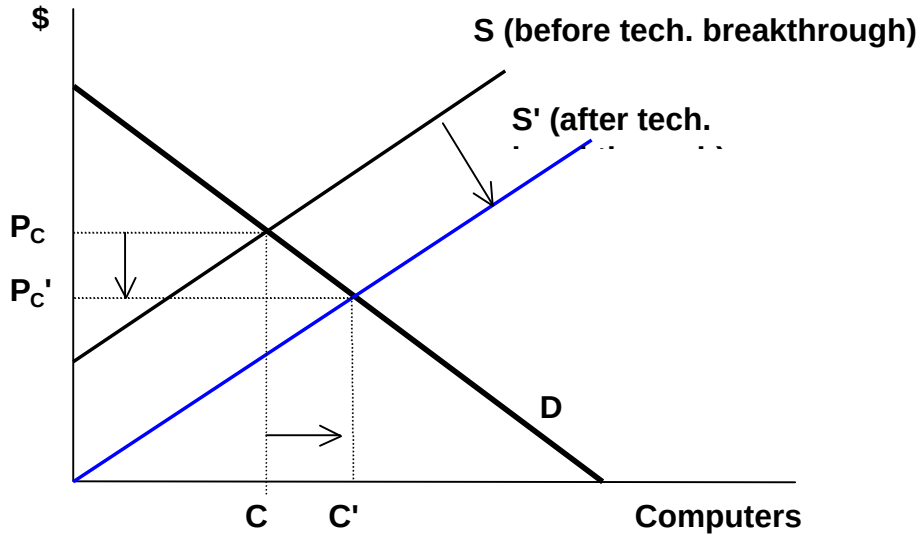
University of British Columbia
Department of Economics

Principles of Microeconomics

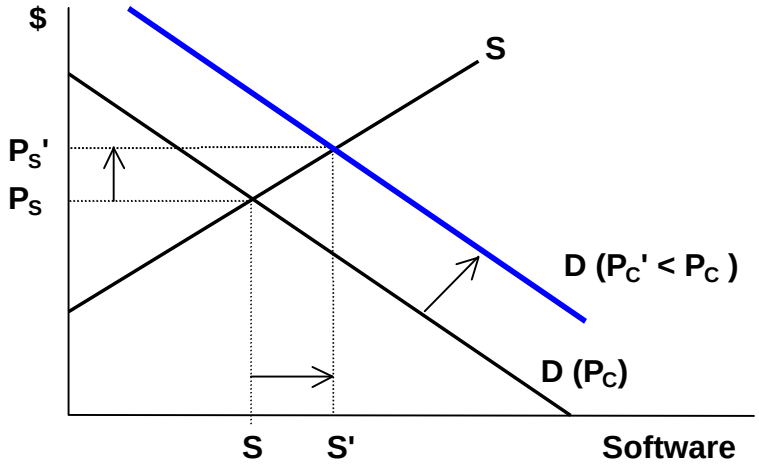
Review Questions #2 (Chapters 4-6)

1. A technological breakthrough reduces the cost of producing computer chips. Using supply and demand diagrams, show the effect of this breakthrough on the equilibrium price and quantity in the following markets:
   a. the market for computers.
   b. the market for software.

(a) Computer Market: The technological breakthrough reduces the MC of producing computers and hence shifts the supply curve to the right. Consequently, price decreases from P_C to P_C' and quantity increases from C to C′.



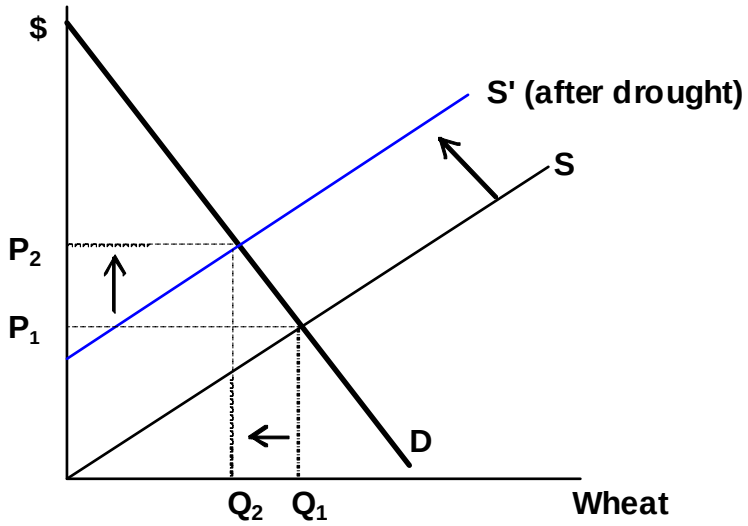
(b) Software Market: Software and computers are complements. So the decrease in P_C (due to technological advance) will shift the demand curve for software to the right. As a result price of software goes up and the quantity of software (consumed or sold) also goes up.



2. Consider public policy aimed at smoking.
    a. Studies indicate that the price elasticity of cigarette demand is about -0.4. If a pack of cigarette currently costs $3 and the government wants to reduce smoking by 20%, by how much should it increase the price?
    b. If the government permanently increases the price of cigarettes, will the policy have a larger effect on smoking one year from now or five years from now?

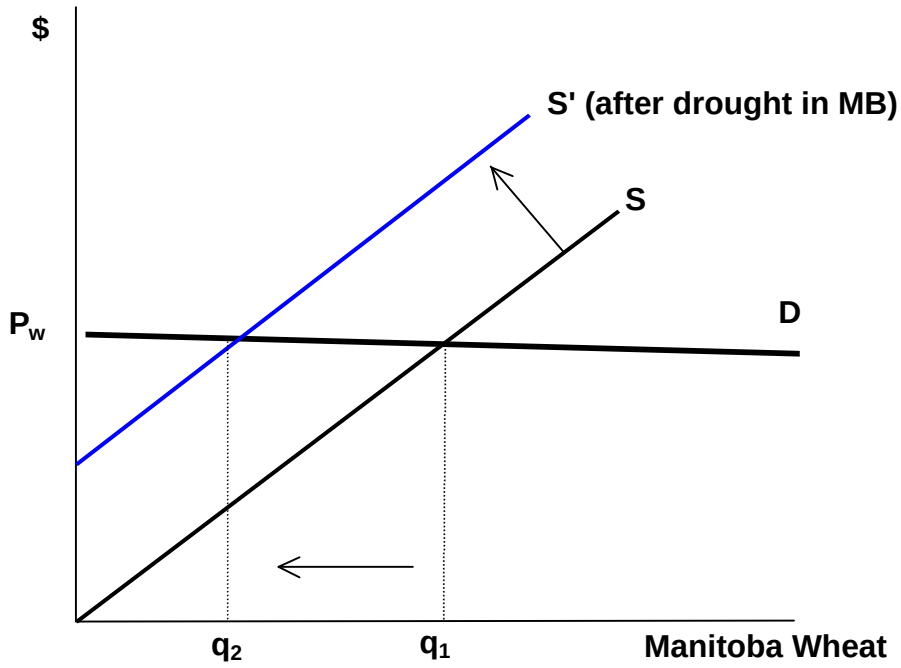
3. Explain why the following might be true. A drought around the world raises the total revenue that farmers receive from the sales of grain, but a drought only in Manitoba reduces the total revenue that Manitoba farmers receive.

a) **World Market for Wheat**:



Drought around the world may raise total Revenue for the farmers when the world Demand is more inelastic such that the price increase due to Supply shift to the left (caused by drought) dominates decrease in quantity of wheat supplied or consumed. In the diagram above, price increase is sufficiently high such that Revenue after drought $R_2 = P_2Q_2 > R_1 = P_1Q_1$.

(b) **Manitoba (MB) Market for Wheat**:

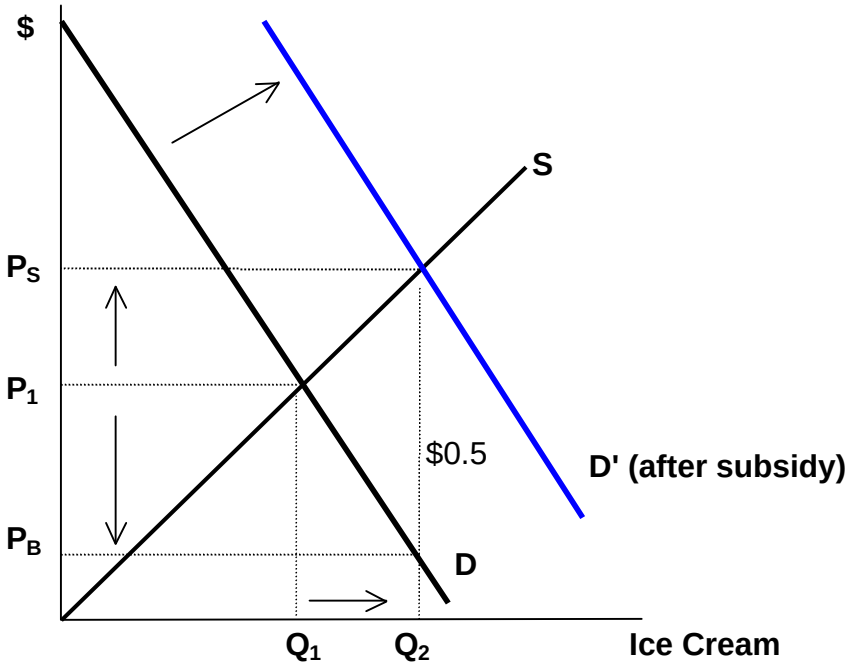


The drought only in MB will shift Supply curve of wheat to the left and consequently decreases wheat production in MB. Since MB farmers produce a small proportion of world wheat market, they must sell all of their production at world Price (P_w) whether there is drought in MB (and so reduces production) or not. Thus, since MB farmers will produce less wheat (due to drought) but have to sell its production at the same Price as before, the Revenue for MB farmers will go down. Revenue after drought $R_2 = P_wq_2 < R_1 = P_wq_1$.

4. A subsidy is opposite of tax.
    a. Show the effect of a \$0.50/cone subsidy on the demand curve for ice-cream cones, the price paid by consumers, price received by sellers, and the quantity sold.
    b. Do consumers and producers gain or lose from this policy? (Ch. 7)

(a) The effect of \$0.5 subsidy:

This will shift the demand curve to the right, the price sellers get will increase to P_S (from P_1) and the price buyers pay will go down to P_B. After subsidy, $P_S - P_B = \$ 0.5$.



(b) Thus both consumers and sellers gain from this subsidy. But how will this benefit be shared between the consumers and the sellers? It depends on the relative elasticity of D and S curves. If Demand (Supply) is more inelastic then consumers (producers) gain more.

5. The Canadian government administers two programs that affect the market for cigarettes. Media campaigns and labeling requirements are aimed at making the public aware of the dangers of smoking. At the same time, Agriculture Canada imposes production quota on tobacco (which is an input for cigarette production), which raises the price of tobacco.

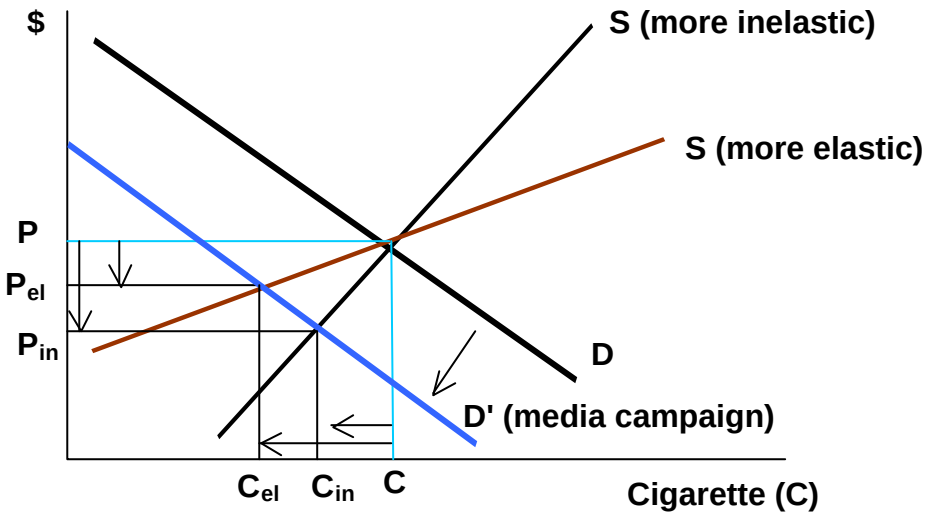
a) How do these two programs affect cigarette consumption?
b) What is the combined effect of these two programs on cigarette price?

(This question is similar to the next two questions)

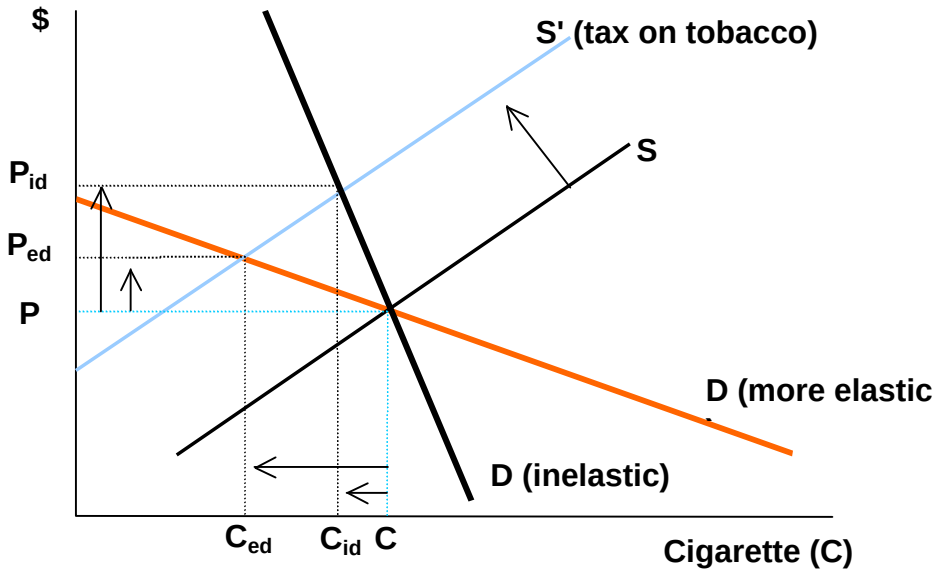
6. The Canadian government aims to reduce smoking among Canadians by (a) media campaigns that makes the public aware of the dangers of smoking and/or (b) imposing tax on tobacco, which is an input of cigarette production. Answer the following questions using S-D diagrams.

(a) Show the effects of media campaign. When will the media campaigns be more effective?
(b) Show the effects of the tax on tobacco. When will this tax be more effective?

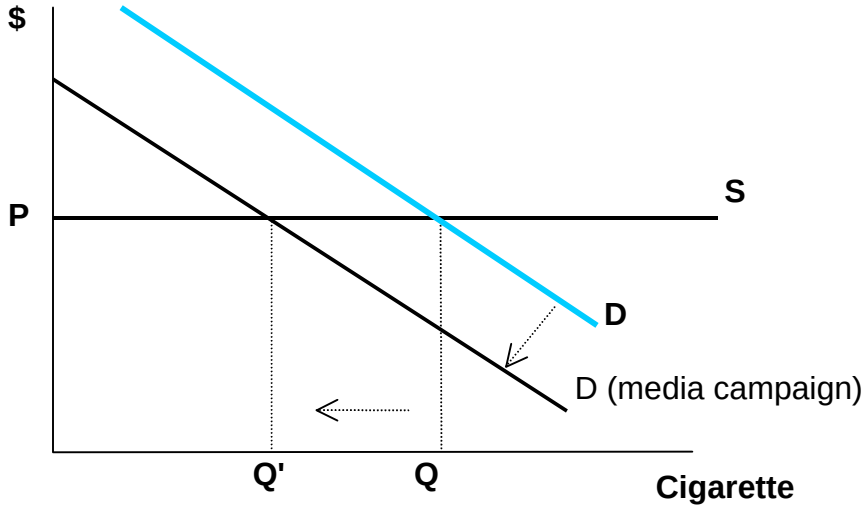
(a) With more elastic S, media campaign is more effective in reducing smoking.



(b) With more elastic D, the tax on tobacco will be more effective in reducing smoking.

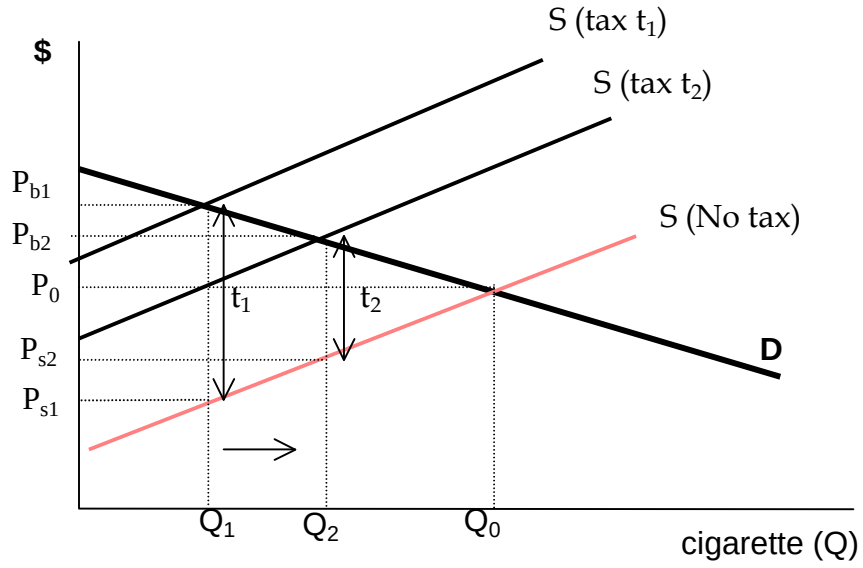


7. The government of Canada is contemplating to use media campaign as a way to make people aware of the adverse health effects of cigarette smoking. Draw a graph illustrating a situation when this media campaign will be most effective.



(Note that in the extreme case of completely elastic demand, such campaign will lead to zero smoking.)

8. The government of Canada is contemplating to decrease the tax rate on cigarette (from say t_1 to t_2). Draw a graph illustrating the situation when this decrease will increase the tax revenue.



9. The demand of Housing in Vancouver is given by $Q_d = 200 - 2P$. Due to Zoning laws, the supply is fixed at 100 units.

(a) Find equilibrium P and Q.

At equilibrium,

$$Q_d = Q_s$$
$$200 - 2P = 100$$
$$P = \$50 \text{ and}$$
$$Q_d = Q_s = 100 \text{ (note supply is fixed at 100).}$$

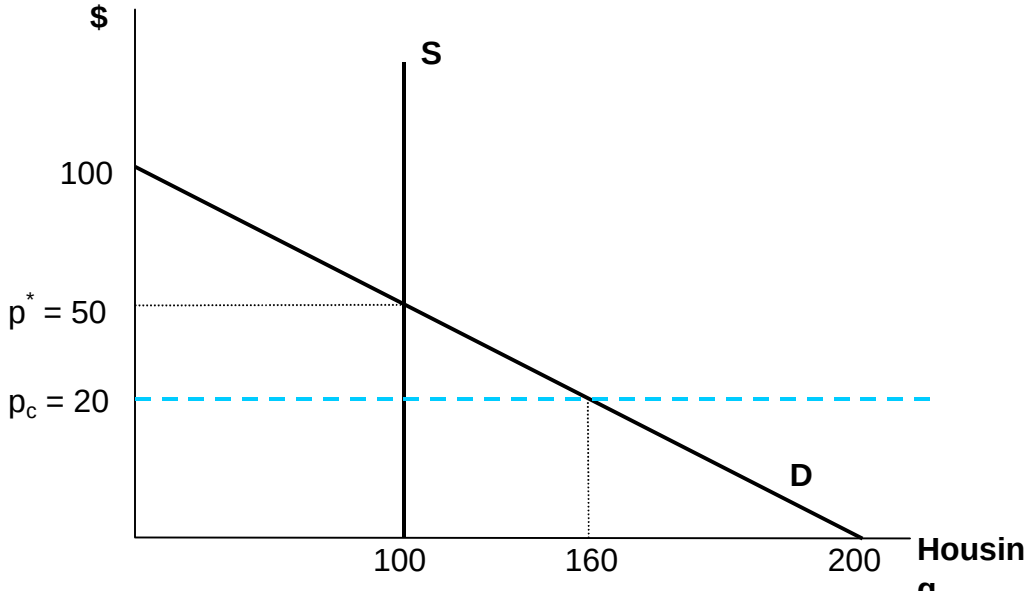
(b) What is the price elasticity of demand at the market equilibrium? Is demand elastic or inelastic?

Price elasticity of demand, $E_D = \frac{P}{Q}\frac{\Delta Q}{\Delta P} = \frac{50}{100}.(-2) = -1$ (demand is unit elastic).

(c) What is the price elasticity of supply at the market equilibrium point? Interpret your result.

Price elasticity of supply is $E_S = 0$ (completely inelastic). The supply will not change (remains fixed), no matter how the price changes.

(d) Vancouver City thinks that the equilibrium market price is too high for the low-income families. If the City council imposes a price ceiling of \$20, what is the likely effect of this policy on the market (calculate the magnitude of the effect)?



(e) Calculate the changes in CS and PS caused by city's policy.

Before Price ceiling:
$CS_1 = 0.5(100 - 50)*100 = 2500.$
$PS_1 = 50*100 = 5000$
After Price ceiling:
$CS_2 = 0.5(100 - 50)*100 + 100*(50 - 20) = 5500.$
$PS_2 = 20*100 = 2000$

10. The supply and Demand of Housing in Vancouver is given by

$$Q_d = 22 - 2P$$
$$Q_S = 2 + 2P$$

a) Find equilibrium P and Q.

b) Vancouver City thinks that the equilibrium market price is too high for the low-income families. If the City council imposes a price ceiling of $ 4, what is the likely effect of this policy on the market?

c) Calculate the changes in consumer and producer surpluses caused by city's policy (chapter 7)

(This question is similar to Q 9)

11. Suppose that your demand schedule for CD, Q, is as follows

Price ($)	**Q when** Income = $10, 000	**Q when** Income = $12,000
8	40	50
10	32	45
12	24	30

a) Calculate (and also interpret) your *price elasticity of demand* as the price of CD increases from $8 to $10 if your income is $ 10,000.

b) Calculate income elasticity when I increases from 10,000 to 12,000 and when P= $12.

(a) Price elasticity of demand (midpoint method)

$$E_P = \frac{\Delta Q / Q}{\Delta P / P} = \frac{(Q_2 - Q_1)/Q_{av}}{(P_2 - P_1)/P_{av}} = \frac{(32-40)/36}{(10-8)/9} = -1$$

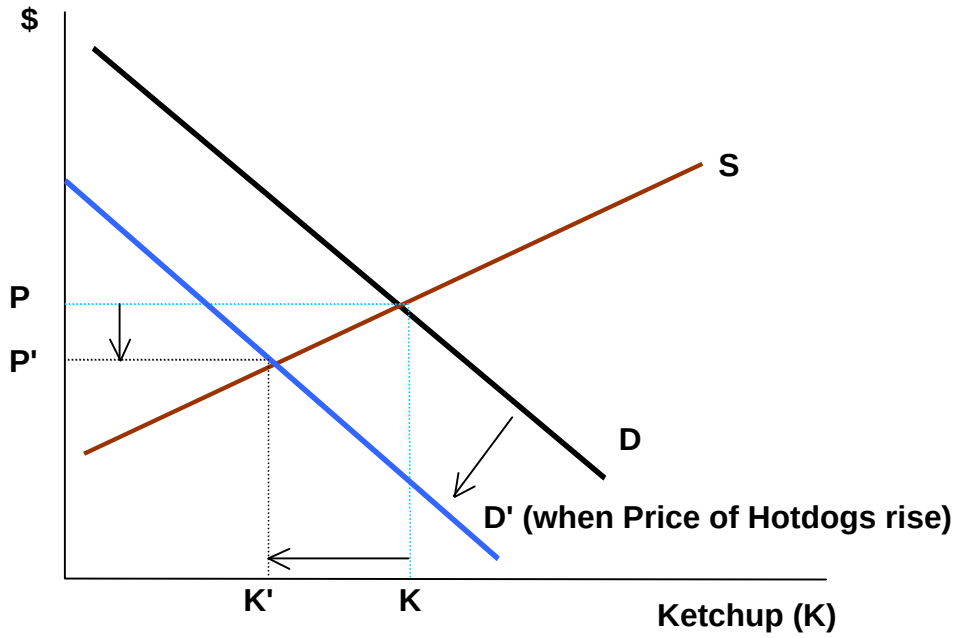
Since $|E_P| = 1$, demand is unit elastic.

(b) Income elasticity of demand

$$E_I = \frac{\Delta Q / Q}{\Delta I / I} = \frac{(Q_2 - Q_1)/Q_1}{(I_2 - I_1)/I_1} = \frac{(30-24)/24}{(12-10)/10} = 5/4$$

Since $E_I > 0$, the good is a normal good (whose demand is income elastic too).

12. Ketchup is a complement (as well as a condiment) for hot dogs. If the price of hot dogs rises, what happens to the market for ketchup?

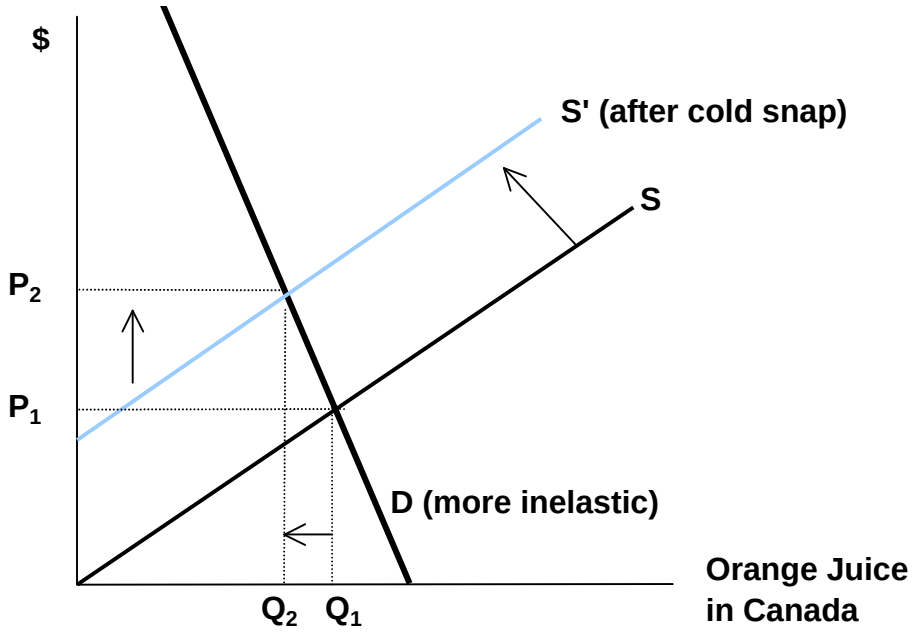


13. Explain each of the following statements using S and D diagrams.
    a. When a cold snap hits Florida, the price of orange juice rises in supermarkets throughout Canada.
    b. When the weather turns warm in Quebec every summer, the prices of hotel rooms in Caribbean resorts plummet.
    c. When a war breaks out in the Middle East, the price of gasoline rises, while the price of a used SUV falls.

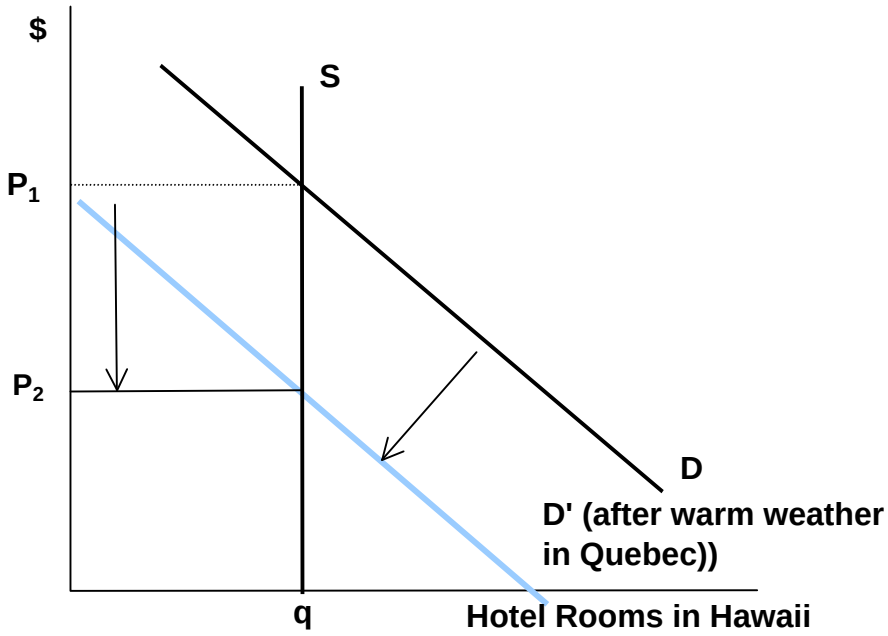
(Similar to Q. 14 below, except that Q. 14 says the changes are substantial.)

14. Draw the S and D diagrams to illustrate the following two situations:
    a. When a cold snap hits Florida, the price of orange juice rises in Canada *substantially*.
    b. When the weather turns warm in Quebec, the price of hotel rooms in Hawaii *plummet*.

a. When cold snap hits FL, the production of oranges will decrease and hence the supply curve of Orange Juice in Canada will shift to the left. If demand of Orange Juice in Canada is highly inelastic, it will likely to cause a substantial increase in price.



(b)
When weather turns warm in Quebec, many tourists may visit Quebec instead of Hawaii, shifting the demand curve for hotel rooms in Hawaii down. Given the supply of hotel rooms in Hawaii fixed (at least in the short- run), this may cause a sharp decrease in price of hotel rooms in Hawaii. (you may draw a very inelastic D curve, not necessarily perfectly as shown).



15. The government has decided that the free-market price of cheese is too low.

a) If the government imposes a binding price floor in the cheese market, what will be the effect of this price floor?(Hint: Surplus. Show this in your diagram)

b) Farmers complain that the price floor has reduced their total revenue. Is this possible? Explain with a diagram.(Hint: Possible if D is sufficiently elastic. Draw a diagram.)

c) In response to farmers' complaints, the government agrees to purchase all of the surplus cheese at the price floor. Compared to the basic price floor of (a), who benefits from this new policy? Who loses?

(Farmers gain because they can sell all surplus cheese at a higher price and of course consumers lose because they have to pay a higher price).

16. Parliament decides that Canada should reduce air pollution by reducing its use of gasoline. It imposes a $0.50 tax for each liter of gasoline sold.

a) Should it impose this tax on producers or consumers? Explain carefully, using a supply-and-demand diagram. (Hint: It doesn't matter; either way the final results (P_b P_s and resulting Q are the same. Draw diagrams showing this equivalency).

b) If the demand for gasoline were more elastic, would this tax be more effective or less effective in reducing the quantity of gasoline consumed? Explain with both words and a diagram.

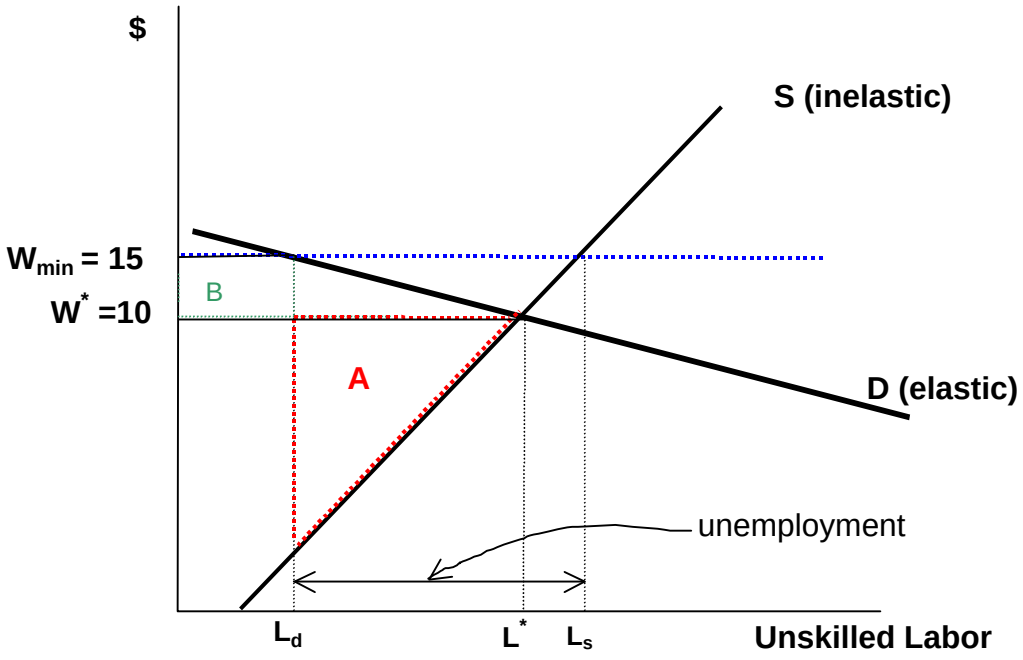
c) Are consumers of gasoline helped or hurt by this tax? Why
d) Are workers in the oil industry helped or hurt by this tax? Why?

(Try b, c and d on your own).

17. Government of Canada thinks that the current equilibrium wage of $10 for unskilled workers is too low and decides to help the unskilled workers by setting minimum wage at $15. Will this minimum wage legislation help the unskilled workers? Show in your diagram a situation in which the workers (in total) will in fact lose rather than gain from this legislation.

A = loss of workers' surplus for those who lose jobs
B = gain in workers' surplus due to higher wage to those who can keep the jobs.
Loss of workers' surplus = A – B.

A is likely to be greater than B when D is relatively more elastic than S.



18. Classify each of the following statements as positive or normative. Explain.
a) Society faces a short-run tradeoff between inflation and unemployment.
b) A reduction in the rate of growth of money will reduce the rate of inflation.

c) The Bank of Canada should reduce the rate of growth of money.
d) Society ought to require welfare recipients to look for jobs.
e) Lower tax rates encourage more work and more saving.

19. Pat and Kris are roommates. They spend most of their time studying (of course), but they leave some time for their favorite activities: making pizza and brewing root beer. Pat takes 4 hours to brew 5 L of root beer and 2 hours to make a pizza. Kris takes 6 hours to brew 5L of root beer and 4 hours to make a pizza.

a) What is each roommate's opportunity cost of making a pizza? Who has the absolute advantage in making pizza? Who has the comparative advantage in making pizza?

b) If Pat and Kris trade foods with each other, who will trade away pizza in exchange for root beer?

c) The price of pizza can be expressed in liters of root beer. What is the highest price at which pizza can be traded that would make both roommates better off? What is the lowest price? Explain.

20. Consider the market for minivans. For each of the events listed below, identify which of the determinants of supply or demand are affected. Also indicate whether demand or supply is increased or decreased. Then show the effect on price and quantity of minivans.

a) People decide to have more children.
b) A strike by steelworkers raises steel prices.
c) Engineers develop new automated machinery for the production of minivans.
d) The price of SUVs rises.
e) A stock market crash lowers people's wealth.