EXAM 1 – EC 600 Spring 2012

Name: KEY

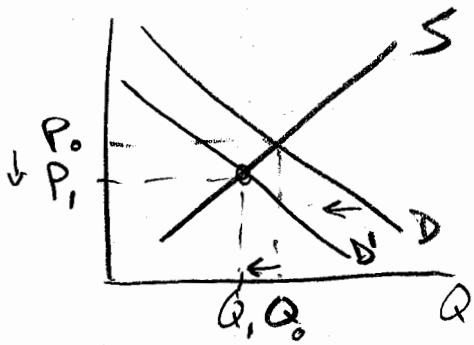
Total Points: ~~100~~ 105

Supply and Demand

Be sure to draw clear diagrams, state which factors of supply and/or demand are affected, which curve they affect, and, finally, write your "answer" out to the side of your diagram.

1. Suppose the price of traditional textbooks increases over the coming years.
   a. (5 points) What is the effect of this in the market for university courses?

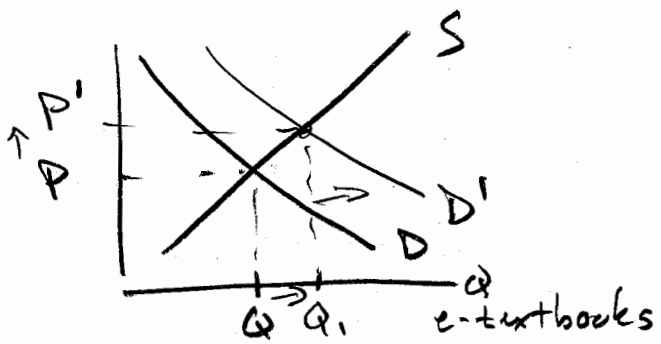
$\uparrow P_{books}$ -> Compl to ↓ courses -> ↓D



↓P ; ↓Q

   b. (5 points) What is the effect of this in the market for e-textbooks?

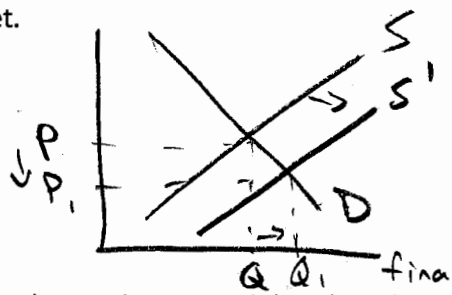
$\uparrow P_{books} \Rightarrow \uparrow P_{subst}$ -> ↑D



↑P ; ↑Q

2. Part of the cause of the recent financial crisis was the new securitization of financial instruments. New technology significantly lowered the cost of developing and providing these instruments.
   a. (5 points) Show the effects this technological development in the financial instruments market.

↓Cost of Prod -> ↑S



↓P ; ↑Q

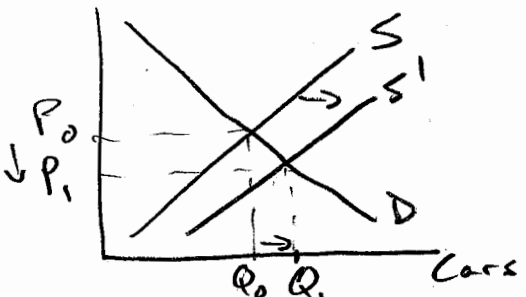
   b. (5 points) Many have noted that these instruments were so widely adopted because they were so cheap. Is this reflected in your answer in part (a)? Explain.

Yes. ↓P -> ↑Q^d

3. "Cash-for-clunkers" was a summer 2009 program that gave individuals extra cash for trading in old cars and buying newer, more fuel-efficient cars. While this was like cash in the pocket of consumers, it was also a temporary program. Car companies stated that they knew as soon as the program ended, car prices would fall rapidly.

   a. (5 points) Analyze the effect of this program in the market for cars.

↑I → ↑D
↓P^e_{t+1} → ↑S_t
→ ↓D_t



↓P ∴ ↑Q

Answers Vary based on assumptions but ↓P^e_{t+1} → ↑S_t must be in the answer

   b. (5 points) Newspapers reported that the price of cars skyrocketed during this program. Is this consistent with your analysis in part (a)? Explain.

No because I assumed the ↑I ∴ ↓P^e offset each other and left no ΔD.
This info suggests ↑I was strong ∴ ↑↑D.

4. Production

5. (5 points) Explain why the law of diminishing returns also means that marginal costs are always rising.

diminishing returns means that each input leads to a smaller and smaller increase in output
Thus, to purchase +1 unit of output, you have to buy increasingly more inputs.
This is the increase in MC.

6. Consider the following table for production in a firm's facilities in two different countries

Country 1								Country 2						
w1 =	$20							w2 =	$10					
A	K	L	q	MPL	MPL/w	Labor Cost		A	K	L	q	MPL	MPL/w	Labor Cost
10	4	1	20.0			$20		3	4	1	6.0			$10
10	4	2	28.3	8.28	0.41	$40		3	4	2	8.5	2.49	0.25	$20
10	4	3	34.6	6.36	0.32	$60		3	4	3	10.4	1.91	0.19	$30
10	4	4	40.0	5.36	0.27	$80		3	4	4	12.0	1.61	0.16	$40
10	4	5	44.7	4.72	0.24	$100		3	4	5	13.4	1.42	0.14	$50
10	4	6	49.0	4.27	0.21	$120		3	4	6	14.7	1.28	0.13	$60
10	4	7	52.9	3.93	0.20	$140		3	4	7	15.9	1.18	0.12	$70
10	4	8	56.6	3.65	0.18	$160		3	4	8	17.0	1.10	0.11	$80
10	4	9	60.0	3.43	0.17	$180		3	4	9	18.0	1.03	0.10	$90
10	4	10	63.2	3.25	0.16	$200		3	4	10	19.0	0.97	0.10	$100

Suppose you are hired to consult this company. Human Resources proudly explains they have hired twice as many people in Country 2 as in Country 1 since wages are half as much in Country 2. Currently they have 5 workers in Country 1 and 10 workers in Country 2.

a. (5 points) Calculate how much the company currently produces.

$44.7 + 19.0 = 63.7$

b. (5 points) Calculate how much the company currently spends on this allocation of labor.

$\$100 + \$100 = \$200$

c. (10 points) Show that you can use their current total labor budget but reallocate optimally and increase output. Explain how many workers you hire in each country, how much you spend totally and how much you produce now.

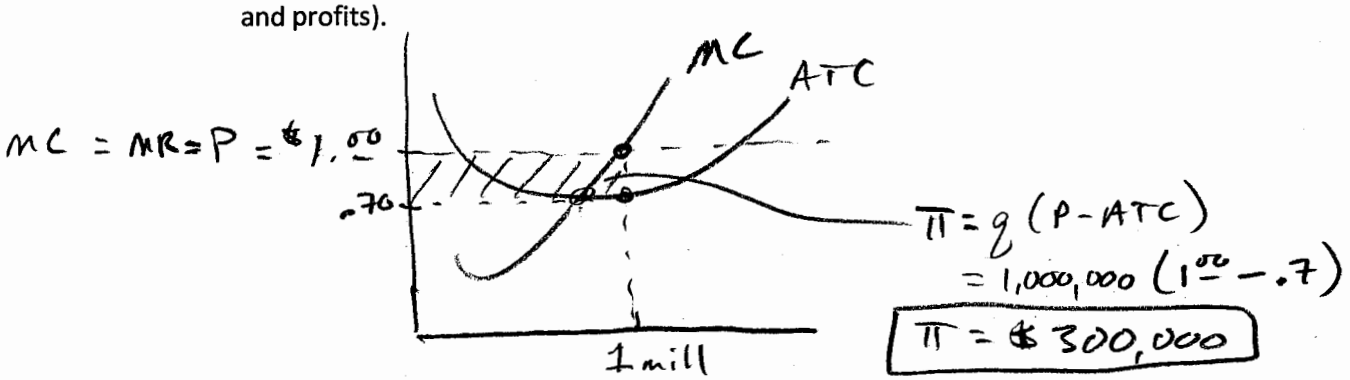
$L_1 = 8$; $L_2 = 3$ $\Rightarrow$ $56.6 + 10.4 = 67 > 63.7$

at a cost = $\$160 + \$30 = \$190 < \$200$

If we wanted to spend the last \$10, we'd hire one more L_2 since this is what we can afford.

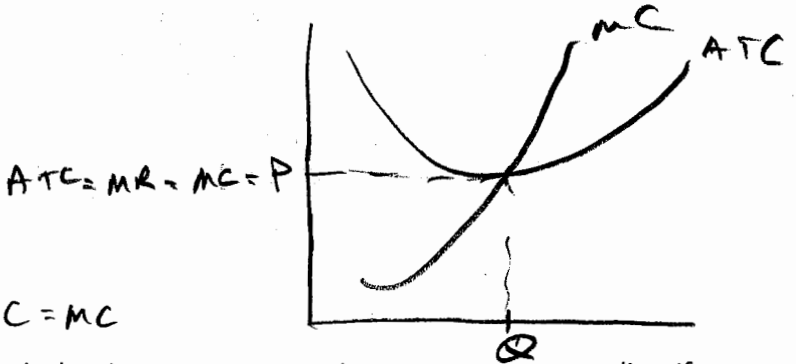
Competition, Entry and Exit

7. Suppose that the cupcake industry is perfectly competitive. Each firm produces 1 million cupcakes per year. The cupcakes have an average total cost of $0.70 each and they sell for $1.00.
   a. (5 points) Draw a basic MC & ATC diagram for a cupcake firm. Be sure to label everything in your graph according to the information above (i.e., ATC, MC, MR, P, q, and profits). Note: you should have exact numbers for all those (i.e., ATC, MC, MR, P, q, and profits).



   b. (10 points) This industry is not in long-run equilibrium. Explain what will happen over the long run and draw the correct MC & ATC diagram for this firm in the long-run. ~~Be sure you use the correct numbers for ATC, MC, MR, and P (ignore the actual quantity, q, in the long-run).~~

π > 0 so there will be entry. This will ↓P until π = 0 which occurs when P = ATC = MC



8. (5 points) Discuss why barriers to entry are so important to a monopolist. If a monopolist could buy a barrier to entry, what is the most it would be willing to pay? Be sure to explain your answer.

Entry and Exit is what drives π → 0
Barriers to entry and exit are the only thing that allow monopolists to earn π > 0
Thus, they would pay up to π to keep the barriers since π is the value they get from having the barriers.

EXAM 1 – EC 600 Spring 2012

Elasticity

9. Suppose the price of paperback books falls from \$7.00 to \$6.50 and the quantity demanded rises from 150 to 175.

   a. (5 points) Calculate the arc price elasticity of demand.

$$\%\Delta Q = \frac{175-150}{\left(\frac{150+175}{2}\right)} \times 100 = \frac{25}{162.5} \times 100 = 15.38\%$$

$$\%\Delta P = \frac{6.50-7.00}{6.75} \times 100 = -7.41\%$$

$$\eta = \frac{15.38}{-7.41} = -2.076$$

   b. (5 points) Is demand elastic, inelastic or unit elastic and what happens to revenue (i.e., rises, falls, no change)? Explain briefly.

$\eta = -2.076 < -1 \Rightarrow$ Elastic so $\downarrow P \rightarrow \uparrow$ Rev

this makes sense because $\downarrow P$ was smaller than $\uparrow Q$

10. The demand curve for good X is given by

$$Q_d = 2000 - 20P_x + 0.8I - 10P_y$$

where Q_d is "quantity demanded of good X", $P_X = \$30$ is the "price of good X", $I = \$50{,}000$ is "consumer income", and $P_Y = \$15$ is "price of good Y".

$$Q = 2000 - 20(30) + .8(50{,}000) - 10(15)$$
$$Q = 41{,}250$$

   a. (5 points) Based on the demand curve above, what is the relationship between good X and good Y? Explain.

$\uparrow P_Y \rightarrow \downarrow Q_D$ so Y must be a complementary good

   b. (5 points) What is the price elasticity of demand? Is demand elastic, inelastic or unit elastic at that point?

$$\eta = \frac{\partial Q}{\partial P}\frac{P}{Q} = (-20)\left(\frac{30}{41{,}250}\right) = -.015 > -1 \Rightarrow \text{Inelastic}$$

   c. (5 points) What is the income elasticity of demand?

$$\eta_I = \frac{\partial Q}{\partial I}\frac{I}{Q} = (.8)\left(\frac{50{,}000}{41{,}250}\right) = .97$$

   d. (5 points) If incomes are projected to increase by 5% next year, by how much should suppliers expect demand for good X to change by?

$(.97)(5) = 4.85\%$ $\uparrow Q^d$ by 4.85%

Some people calculated the actual change in Q^d

$\Delta Q^d = +2{,}000.$

Equations you may or may not need:

$$\frac{MPL_1}{w_1} = \frac{MPL_2}{w_2}$$

$$\pi = q^*\left(P - ATC\right)$$

$$\eta = \frac{\%\Delta Q}{\%\Delta P}$$

$$\eta^{arc} = \frac{\frac{\Delta Q}{average\ Q}}{\frac{\Delta P}{average\ P}}$$

$$\eta = \frac{dQ}{dP}\frac{P}{Q}$$