

Econ 001: Midterm 1 Answer Key
October 4th, 2012

Instructions:

- **This is a 60-minute examination.**
- **Write all answers in the blue books provided. Show all work. Use diagrams where appropriate and label all diagrams carefully.**
- **Write your name and your Recitation Instructor's (TA) name in every blue book that you use.**
- **This exam is given under the rules of Penn's Honor system.**
- **All blue books, blank or filled, must be handed in at the end of this exam. No blue books may be taken from the room.**
- **No calculators allowed!**

The exam consists of 8 multiple-choice questions and 2 short-answer questions.

You need 2 blue books. You are required to use the two blue books as follows:

- **BOOK 1:** write your answers to the **8 multiple-choice questions** on the first page and then write your answers to the **first short-answer question** in the remainder of the book.
- **BOOK 2:** write your answers to the **second short-answer question**.

Part I: Multiple Choice Questions

(Best 7 out of 8: 5 points each/35 points total. Please answer them all):

1. A recent opinion piece in the local paper defended the decision of the police department to purchase \$100,000 worth of expensive new police cars. The author argued that the police department recently raised \$120,000 by auctioning off property seized from drug runners (out of which they paid \$10,000 in salary to the police auctioneers). Since the property would just have moldered away in storage if they didn't sell it, the purchase costs the taxpayers nothing. What was the actual cost of the purchase to taxpayers?

- a. \$0
- b. \$20,000
- c. \$100,000
- d. \$110,000

2. Country A produces oranges and commercial airplanes. Which of the following situations results in a change of the PPF of Country A, in contrast to a movement of the production point to another location on the PPF?

- I. Half of all workers in the commercial airplanes industry switch to jobs farming oranges.
- II. Better fertilizers are developed so that each worker can farm twice as many oranges as before.
- III. A hurricane causes severe damage to orange trees and also to airplane factories around the country.
- IV. Country A finds out that Country B is willing to trade at terms where it is favorable for Country A to trade its commercial airplanes for Country B's oranges. As a result, Country A employs more people in airplane factories and fewer in orange orchards.

- a. I only
- b. II only
- c. II and III
- d. II and IV
- e. II, III and IV
- f. I and III

3. Anti-Bob has a successful catering business. All of his customers want dinner and dessert. It takes Anti-Bob 1 hour to make dinner and 1 hour to make dessert. He is happy, but then disaster strikes. A new competitor, named Bob, enters the catering market. Bob can make dinner in 10 minutes and dessert in 5 minutes. Which of the following should Anti-Bob do?

- a. Leave town since he can never compete with Bob, who is better in every way.
- b. Offer to make dinners for Bob's business.
- c. Offer to make desserts for Bob's business.
- d. Offer to split the dinner and dessert making evenly between them.
- e. Offer to make $\frac{2}{3}$ of the dinners and $\frac{1}{3}$ of the desserts.

4. Compared to the equilibrium price and quantity, which of the following changes could cause the price to increase and the quantity to decrease in the market for sneakers?

- a. New technology makes the production of rubber (an essential component of sneakers) cheaper.
- b. Sneaker manufacturers invest in celebrity endorsements causing an increase in the popularity of sneakers.
- c. An economic recession decreases consumers' income and sneakers are a normal good.
- d. Worker wages increase.

5. The income elasticity of demand for umbrellas in Pennsylvania is 0.5. If income decreases by 10%, then we can say that:

- a. Quantity demanded decreases more than 10%
- b. Quantity demanded decreases less than 10%
- c. Quantity demanded increases more than 10%
- d. Quantity demanded increases less than 10%

6. Consider an industry with a standard upward sloping supply curve. Now imagine that technology has advanced, allowing the industry to produce goods much cheaper than before. In which case will the industry's total revenue increase?

- a. Perfectly inelastic demand curve
- b. Unit elastic demand curve
- c. Perfectly elastic demand curve
- d. Since we do not know the shape of the supply curve, we cannot know how revenue will be affected.

7. A recent article in the New York Times suggests that certain foods, such as ice cream, can cause addiction. These foods are likely to have:

- a. Very elastic demand
- b. Very inelastic demand
- c. Unit elastic demand
- d. It is crazy to think that anyone could be addicted to ice cream. This is just more of the liberal, cry baby, entitled mentality that plagues the USA.

8. The soda industry is arguing fervently against a suggested soda tax of \$1 per bottle. This suggests that they think:

- I. The demand for soda drinks is inelastic
 - II. The price for consumers would increase by almost 1\$ because of the soda tax
 - III. The quantity of soda sold would decrease by a lot due to the tax
- a. I, II and III
 - b. I only
 - c. II only
 - d. III only
 - e. I and II only
 - f. II and III only

Answer Key:

- 1. c
- 2. c
- 3. b
- 4. d
- 5. b
- 6. c
- 7. b
- 8. d

THIS IS STILL PART I: USE BLUEBOOK I.

Explain answers carefully using graphs where appropriate. Your grade depends on your explanation as well as your answer: so show your work!

Keep your answers short! You only need a sentence or two per section.

Q1. (30 points). Please write your answer in bluebook #1.

Sam has four gardens, one on each side of his house. He grows two crops, raspberries and pumpkins. The productivities of the four gardens are as follows:

	East	North	West	South
Raspberries (baskets)	4	3	5	8
Pumpkins	2	2	2	4
Opportunity Cost of Pumpkins	2	1.5	2.5	2

- a. With raspberries on the vertical axis and pumpkins on the horizontal axis, draw Sam's PPF.
- b. Sam loves raspberries but doesn't care for pumpkins. However, he has promised four of his friends each a pumpkin for Halloween. Sam is trustworthy: he keeps his promises both in this case and all subsequent parts of the question. Calculate and show Sam's desired production point on the PPF.
- c. A local jam factory wants to do business with Sam. They will give him one pumpkin for every basket of raspberries he is willing to trade. Will Sam engage in trade? If so, draw his consumption frontier, his production point and consumption point. Explain what goods he imports and exports and specify the quantities of each.
- d. A local pie factory is in needs of pumpkins and so their manager too wants to make a deal with Sam. Suppose the manger offers three baskets of raspberries for every pumpkin Sam sells. Which food manufacturer will Sam prefer to do business with? Explain numerically and graphically.

a. Answer:

PPF with three slopes (or 2 kinks). Points are (0,20);(2,17);(8,5);(10,0)

Points: 10

General shape (kinks): 2

Each point: 2

b. Answer:

Points at 4 pumpkins and $(17-2*2)=13$ raspberries.

Points: 4

2 for graph method, 2 for numerical answer.

(3 out of 4 if math error)

c. Answer:

Sam will specialize in raspberries. His CPF is a straight line from (0,20) to (20, 0).

He will produce at (0,20) and consume at (4, 16). He exports 4 raspberries and imports 4 pumpkins.

Points: 10

CPF straight line: 2

Correct intercepts: 2 (1 each)

Production point: 1

Consumption:1

Exports: 2 (1 for raspberries, 1 for 4)

Export: 2 (1 for pumpkins, 1 for 4).

d. Answer:

The new CPF is from (0, 30) to (10, 0). As we know something about his preferences we know that this CPF is better for him as it allows him to consume more raspberries with the same number of pumpkins. Specifically, he will now specialize in pumpkins, keep 4 and export 6. This allows him to import 18 baskets of raspberries which is greater than the number consumed in part c.

Points: 6

New CPS: 2 (for intercepts; or 1 intercept and slope))

Better off given his preferences: 2

Exact numeric calculation: 2

Part II:

Q2. (35 points). Please write your answer in bluebook #2.

Note: at the end of this question you should have at least 3 different graphs.

Subsidies to the corn production account for nearly 35% of all agricultural subsidies paid by the U.S. Government. In this question you will use the basic Supply and Demand model to analyze some of the effects of these subsidies on the market for corn and other related goods.

- a. Suppose that there are no subsidies in the market for corn. Draw a typical supply and demand graph of the market for corn. Label the equilibrium price and quantity. Mark the total surplus generated by this market.
- b. The government introduces a subsidy of $\$X$ per unit of corn sold. In your graph, show the effect of this subsidy on the equilibrium quantity of corn. What happens to the price paid by the corn buyers? What happens to the price received by the corn producers? Label these prices in the graph you drew in part a.
- c. Mark the Dead Weight Loss, if any, which is created by the subsidy. What does this imply about the total surplus generated with a subsidy? How does it compare to the total surplus created in part a.?
- d. Corn is an input in the production of high fructose corn syrup (HFCS). Graphically show the effect of the subsidy you discussed in part b. on the equilibrium price and quantity of HFCS.
- e. HFCS and sugar are substitute goods. What does this tell you about the cross price elasticity of the demand for sugar and HFCS? Graphically show the effect of the subsidy discussed in part b. on the equilibrium price and quantity of sugar.

a. Answer:

Typical graph. T.S. bounded by D & S up to Q^* .

Points: 5

S & D graph with P^* & Q^* :2

T.S.: 3

b. Answer:

Shift supply down by $\$X$. New equilibrium at intersection of S' and D and quantity increased $Q' > Q^*$.

Mark P^d (S' and D) and P^s ($P^d + X$).

Note $P^d < P^* < P^s$, so the price to consumer fell and to the producer rose.

Points: 10

Shift of S down: 2

Larger quantity market correctly: 2

New P^d : 2

New P^s : 2

Price consumer declined and to producer increased: 2

(Note: lose 4 points if don't distinguish between two prices)

c. Answer:

DWL between Q^* and Q' , between S and D. Total surplus is now smaller and equal to that shown in [part a minus the DWL.

Points: 6

Correct DWL: 2 (note only 1 if mark congruent triangle)

Understanding that surplus is now lower: 2

Understanding that it is smaller by the amount of DWL: 2

d. Answer:

New graph showing S & D for HFCS. It is important to label this as the market for HFCS in some way so we don't confuse the various market discussed in this question. Mark P_0^{HFCS} & Q_0^{HFCS} .

The reduced price of corn to the consumers (in this case the manufacturers of HFCS who use it as an input) shifts supply for HFCS out. As result the equilibrium quantity increases and the equilibrium price decreases,

$P_1^{HFCS} < P_0^{HFCS}$ & $Q_1^{HFCS} > Q_0^{HFCS}$

Points: 6

Understanding that this question is about a separate market: 2

Shift Supply out: 2

New equilibrium:2

e. Answer:

New graph showing S & D for Sugar. It is important to label this as the market for Sugar in some way so we don't confuse the various market discussed in this question. Mark P_0^{sugar} & Q_0^{sugar} .

As HFCS and Sugar are substitute the cross price elasticity is positive: the lower price of HFCS will reduce demand for sugar. Demand for sugar shifts in. As result the equilibrium quantity decreases and the equilibrium price decreases,

$P_1^{\text{sugar}} < P_0^{\text{sugar}}$ & $Q_1^{\text{sugar}} < Q_0^{\text{sugar}}$

Points:8

Understanding that this question is about a separate market: 2

Cross price elasticity positive: 2

Shift demand in: 2

New equilibrium:2