

Econ 001: Midterm 1 Answer Key  
February 8, 2005

**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 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.**
- **The use of Programmable Calculators is in violation of Departmental rule. It is strictly forbidden!**

The Midterm has 2 parts.

Part 1 consists of 10 multiple-choice questions. Please use the first page of a blue book to record your answers.

Part 2 consists of 2 short answer questions. Please use a separate blue book for each.

**Part I: Multiple Choice Questions (4 points each/40 points total):**

1.

The economic cost of going to a U2 concert should include:

- a. The price of the ticket.
- b. Cost of transportation.
- c. Opportunity cost of ones time.
- d. All of the above.

2. Suppose that US and Canada have the technologies represented in the following table:

	US	Canada
Computers	20/worker	X/worker
CDs	20/worker	50/worker
Population	10000	8000

It is known that US has a comparative advantage in the computer production. Which of the following **cannot** be the X value for Canada?

- a. 5
- b. 25
- c. 45
- d. 65

3.

The number of students applying to Penn is higher than the number admitted. If we interpret this as excess demand, this would imply that:

- a. Penn tuition is the equilibrium price.
- b. Penn tuition is above equilibrium price.
- c. Penn tuition is below equilibrium price.
- d. Penn tuition is fair and equitable.

4. Suppose the following two situations happen in the same period:

- (i) Several domestic airline companies exit the airline industry
- (ii) Record-high unemployment rate results in lower income

Consider the market for plane ticket. Suppose plane ticket is a normal good and other factors remain constant, which of the following statement is true:

- a. The new equilibrium price will be higher than the old equilibrium price
- b. The new equilibrium price will be lower than the old equilibrium price
- c. The new equilibrium quantity will be higher than the old equilibrium quantity
- d. The new equilibrium quantity will be lower than the old equilibrium quantity

5. Every time his gas tank is empty, Mike fills up his car *at the same gas station*. This means that his price elasticity of gas is:

- a. 0
- b. 1
- c. 100
- d. infinite

6. In the econ1 textbook market, the equilibrium price of a textbook is known as \$70. Which of the following is true?

- a. Given a specific supply curve, as the slope of demand curve is steeper, the producer's surplus gets larger.
- b. Given a specific demand curve, as the slope of supply curve is steeper, the producer's surplus gets smaller.
- c. Given a specific demand curve, as the slope of supply curve is steeper, the producer's surplus gets larger.
- d. Given a specific demand curve, regardless of the slope of supply curves, the producer's surplus is fixed.

7. During the Blackout in the summer of 2003 in the Northeast, some power generators and High Voltage (HV) cables were destroyed after a reverse surge in current. Choose the correct statement:

- a. The supply curve for electricity shifts out and the point of allocative efficiency with respect to electricity and oil production remains the same as before;
- b. The supply curve for electricity shifts in and the point of allocative efficiency with respect to electricity and oil production remains the same as before;
- c. The supply curve for electricity shifts out and the point of allocative efficiency with respect to electricity and oil production has changed;
- d. The supply curve for electricity shifts in and the point of allocative efficiency with respect to electricity and oil production has changed.

8. Suppose the supply curve for bananas is given by  $Q_s = 15 + P$  and demand for bananas is given by  $Q_d = 30 - 2P$ . In equilibrium, Consumer Surplus will be:

- a. \$100.
- b. \$250.
- c. \$300.
- d. \$600.

9. Using the information above, if the government imposes a tax of \$2 per unit of banana sold, which of the following statements is true?

- a. There will be a dead weight loss.
- b. The consumer will pay a different price than before.
- c. The consumer pays the entire tax.
- d. Both a and b are correct.

10. A per unit tax will cause **no** dead weight loss if:

- a. Demand is completely inelastic.
- b. Supply is completely elastic.
- c. Demand is completely elastic.
- d. Both b and c are correct.

**Answer Key:**

1. d
2. d
3. c
4. d
5. a
6. c
7. d
8. a
9. d
10. a

**Part II: Short Answer Questions (30 points each/60 points total):**

Please use a separate blue book for each question.

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

**Q1.**

Amy, Bob, and Chris have decided to start a collective farm. They can grow tomatoes and potatoes. They have different abilities in growing the two crops, given by the table below:

	Tomatoes (tons per year)	Potatoes (tons per year)	Opportunity Cost of Potatoes (in terms of Tomatoes)
Amy	4	8	$\frac{1}{2}$
Bob	3	4	$\frac{3}{4}$
Chris	6	1	6

(Note: All units are in tons per year)

- a. Calculate the opportunity cost of potatoes (in terms of tomatoes) for each worker.

**Answer:**

See table above.

**Points: 5**

**2 for indication this is measured in tomatoes.**

**1 each for each person.**

- b. Graph their joint PPF with potatoes on the horizontal axis.

**Answer:**

**This should be a PPF with two kinks.  
Interception with X (potato) axis at 13  
Interception with Y (tomato) axis at 13  
First kink at 8 potatoes 9 tomatoes  
Second kink at 12 potatoes 6 tomatoes**

**Points: 9**

**2 for each intercept.**

**2 for each kink**

**1 for straight lines between kinks.**

- c. If they choose to produce 10 potatoes, what is the maximum number of tomatoes that they can produce? Who will be producing tomatoes? Who will be producing potatoes?

**Answer:**

**To produce 10 potatoes efficiently they will want to use those with the lowest opportunity cost which means that Amy and Bob should produce Potatoes. Amy will spend all her time at this task, but Bob need only spend half his time on Potatoes (Note  $8+4/2=10$ ) which leaves him half the time to produce tomatoes. Tomatoes will be produced by Chris too, so the maximum number of tomatoes produced is  $3/2+6=7.5$ .**

**One could also find this point graphically:**

**Points: 5**

**3 for finding point (1 for answer, 2 for explanation, either numerical or graphical).**

**2 for who does what (1 points for what Amy and Chris do, 1 point for understanding that Bob produces both).**

- d. Graph their marginal cost of potatoes in terms of tomatoes. (Hint: this should be a step function).

**Answer:**

**With Potatoes on the horizontal axis we will have a step function as follows: up to 8 potatoes the O.C. is  $\frac{1}{2}$  from 8 to 12 it is  $\frac{3}{4}$  and from 12 to 13 it is 6.**

**Points: 4**

**1 for understanding axis and the main idea.**

**3 for correct steps.**

- e. The marginal benefit of potatoes is given by  
 $MB=10-Q$   
where MB is the marginal benefit in terms of tomatoes, and Q is the number of potatoes. Calculate and show on your graph from (d) how many potatoes will be produced.

**Answer:**

**To find the optimal production point we need to set  $MC=MB$ .**

**Graphically this means adding the line  $10-Q$  to the step graph from part d. If you do this you can see that the lines intercept at the second step. In other words we need to find the point where  $10-Q=3/4$  or  $Q=9.25$**

**Points: 7**

**2 for understanding that we are looking for the point where  $MC=MB$ .**

**2 for adding the MB to graph from d and indicating point on it.**

**3 for correct number of potatoes.**

**Q2.**

The price for cookies has fallen by 10 percent in the last two years. MonsterCookie, a cookie manufacturer, has hired you as a consultant to help them understand this change.

a. (15 points) You have found out that during this time there have been two changes affecting demand:

1. income has increased
2. the price of milk has risen.

Using the standard supply and demand model (&graphs!) show how each of these changes (separately) may explain the decrease in the price of cookies. Be careful to specify any assumptions you need to make.

In one sentence: Which explanation makes the most sense to you? Why?

**Answer:**

**Change #1: If cookies are an inferior good an increase in income will shift the demand curve down. This will result in lower equilibrium quantity and lower equilibrium price, consistent with the drop in price.**

**Change #2: If the price of milk has gone up and the two good are complements the demand for cookies will decrease. Again, we will have shift the demand curve down. This will result in lower equilibrium quantity and lower equilibrium price, consistent with the drop in price.**

**A full answer must include a graph of s&d before and after the shift plus an explanation of why the demand shifted. See points below.**

**Cookies are probably a normal good in which case the increase in income should have shifted the demand curve out and only change #2 would result in lower prices.**

**Points: 15**

**For *each* of the two changes: S & D graph before change: 1 points**

**Shift of demand curve down 1 point**

**Equilibrium after change has lower price: 1 point.**

**Change #1: Explaining that the shift down in the demand is consistent with the good being inferior: 3 points**

**Change #2: Explaining that the shift down in the demand is consistent with cookies and milk being complements: 3 points**

**3 points for reasonable explanation of why one change makes more sense.**

b. (9 points) Your boss suggests that maybe the decrease in price is due to a change on the supply side. List three changes in supply that could cause the drop in price. (A full answer is only 3 lines long).

**Answer:**

**A decrease in the price of an input in making cookies (e.g., flour, labor).**

**An improvement in technology.**

**Entry of new firms.**

**Points: 3 each.**

c. (6 points) The demand elasticity for cookies is 0.66.

Suppose the fall in price was due to a shift in the supply. What will be the effect on total revenue from cookies?

Suppose the fall in price was due to a shift in the demand. What will be the effect on total revenue from cookies?

**Answer:**

**In the case of a shift in supply: price goes down but quantity increases. To know what the effect is on TR we must use the fact the demand is inelastic. This means that the change in quantity will be less important than the change in price and total revenues will decrease.**

**In the case of a shift in demand: price & quantity will decrease in this case so clearly TR will go down (irrespective of elasticity of demand).**

**Points: 3 each. 1 for answer. 2 for explanation.**

**Shift in supply explanation must refer to elasticity.**

**Shift in demand explanation must show understanding that this is irrespective of elasticity.**