Econ 001: Midterm 1
February 11th, 2013

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. Ellie's Tuesday morning class was cancelled! She now must decide how to spend her extra-time. She has three, mutually exclusive, options for activities: go to the library and study for her Econ midterm, which costs her nothing and which she values at $10, go to a movie, which costs her $5 and which she values at $30, or have lunch with a friend, which costs her $10 dollars and which she values at $55. What is the opportunity cost of having lunch with her friend?

   a. 0
   b. 10
   c. 25
   d. 35
   e. 40
   f. 45
   g. 50

2. Susie and Lucy are stranded on an island. They can only produce hats or collect berries. Their production possibilities are given in the following table:

	Hats (per day)	Berries (per day)
Susie	X	Y
Lucy	W	Z

If we know that Susie has an <u>absolute</u> advantage in the production of hats, which of the following is true?

 a. X is bigger than W
 b. X is bigger than Y
 c. Y/X is less than Z/W
 d. Y/X is greater than Z/W

3. Using the information from the table above, if we know that Susie has a <u>comparative</u> advantage in the production of hats, which of the following is true?

 a. X is bigger than W
 b. X is bigger than Y
 c. Y/X is less than Z/W
 d. Y/X is greater than Z/W

4. Audrey has noticed that the market price for roses has increased by 5%. Being a fantastic economist she concludes from this fact that:

 a. the supply of roses has decreased.
 b. the supply of roses has increased.
 c. the supply of roses has not changed.
 d. that she needs more information to analyze the market.

5. Suppose potatoes are an inferior good. Then their income elasticity is

 a. greater than 1.
 b. between 0 and 1.
 c. negative.
 d. necessarily less than -1.

6. Suppose the producer is facing a downward-sloped linear demand curve. If the producer has power to set the price and wants to maximize revenues, he will choose the price where demand is _____.

    a. elastic
    b. inelastic
    c. unit elastic
    d. without further information, it is difficult to tell

7. The government is attempting to help consumers by imposing a maximum price of 25 cents per pound of apples. The president (you're a member of his cabinet) asks you to estimate the deadweight loss of this policy. You know that without the policy the price of apples would have been 35 cents and 1000 <u>more</u> apples would have been produced. Assuming straight-line demand and supply curves (with slopes of 1), what do you tell him?

    a. 50 dollars
    b. 100 dollars
    c. 200 dollars
    d. 400 dollars

8. First Lady, Michelle Obama, is pushing for a subsidy of healthy foods such as apples. She states that such a policy will have the following effects:
        1. Make apples more affordable.
        2. Encourage more people to buy apples.
        3. Make society better off.

Using our model of supply and demand, which claims do you agree with?

    a. Only 1
    b. Only 2
    c. Only 3
    d. Only 1 and 2
    e. Only 2 and 3
    f. All three claims are correct using our model.

Answers:
1. d
2. a
3. c
4. d
5. c
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 and draw clear graphs.
Keep your answers short! You only need a sentence or two per section.

Q1. (30 points). Please write your answer in bluebook #1.
This question requires a series of graphs.

Alice and her friends, the Mad Hatter and the March Hare, produce tea cups and hats with their labor and some raw materials. If they produce only hats, then they can produce 15 in a day, and if they produce only tea cups, then they can produce 20 in a day.

a. Assume that, together, their production technology exhibits constant opportunity costs. Draw their PPF with hats on the x-axis.

b. Assume that, together, their production technology exhibits smoothly increasing opportunity costs. Draw their PPF with hats on the x-axis. Use this assumption for the rest of the question.

c. Suppose that the Mad Hatter discovers a more efficient way to produce hats, such that they can now produce 20 hats in a day. Can they produce more hats than before? What about tea cups? Prove your conjectures graphically.

d. Suppose instead that the Mad Hatter "accidentally" spills some of their paint on the March Hare, which reduces their ability to make tea cups but does not affect the production of hats. Show on **new graphs** the effect on the PPFs you drew in part b.

Return the assumption of a maximum of 15 hats or 20 tea cups a day.

e. Suppose that the outside world offers them a trade at a price of 1 tea cup/hat. Would they take this trade? Why or why not? Explain on a **new graph** with a PPF and CPF.

f. Lastly, suppose that the magical Cheshire Cat approaches the three with the following offer: "I can either make your opportunity costs constant (as in a) or increasing (as in b)" Which should they choose? Does it depend on whether or not trade is available? Explain using a **new graph**.

Answers:

a. Answer:
Straight line PPF. Intercepts: 15 hats on x-axis, 20 tea cups on Y axis.

Points: 5
Labeling axis: 1
Correct intercepts: 2
Straight line: 2

b. Answer:
Curved (bowed out) PPF. Intercepts as above.

Points: 4
Correct intercepts: 1
Curved: 2
Out: 1

c. Answer:
The new PPF is going to have the same intercept on the y axis but a bigger intercepts on the X axis.
Unless they were only producing tea cups before the technological improvement, they would now be able to produce more of both goods. One can see his by drawing a point on the original PPF and then a point on the new PPF where more hats AND more tea cups are produced.

Points: 6
New PPF still bowed out: 1
New intercepts correct: 2
Comparing an original point and a new point: 3 (max 2 out of 3 if the graphical proof is not clear)

d. Answer:

A shift IN of the PPF on the tea cup axis only. This is the opposite of a technological improvement.

Points: 4
Intercept on X axis is still 15: 1
Intercept on Y axis less then 20: 2
Still bowed out: 1
e. Answer:
They would. The CPF would be tangent to the PPF with a slope of 1. We can see that it allow consumption options that were not available before.

Points:5
Adding a straight CPF:1
Not inside PPF:1
Tangent to PPF:2
Understanding more options now available: 1

f. Answer:
Comparing two graphs: the one in part a with the one in part b super imposed on each other, with the same intercepts in each, we can see that option b allows greater gains from specialization *and* a CPF that is further out. Therefore they will choose this option whether or not they trade.

Points: 6
Comparing the two PPFs correctly:3 (2 for correct answer, 1 for nice graph)
Comparing the two CPF:3 (2 for correct answer, 1 for nice graph)

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

Note: Show your work. Partial credit depends on the TAs ability to follow your work.

St. Catherine is a small island nation in the Caribbean. The government of St. Catherine intends to build at 10-lane expressway connecting the capital and the main port on the island. The government intends to finance by imposing a tax of $0.60 for every gallon of gasoline sold in St. Catherine.

The yearly demand for gasoline in St. Catherine is given by:
$$P^d = 20 - Q^d/50$$

The yearly supply of gas in St. Catherine is given by:
$$P^s = 5 + Q^s/100$$

a. Find the equilibrium price and quantity of gas <u>before</u> the government of St. Catherine imposes the new gas tax.

b. Find the Consumer Surplus, Producer Surplus and Total surplus before the tax is imposed. A clear graphical answer will ensure partial credit.

c. Is the market producing the efficient quantity of gasoline? Explain why or why not.

The government is considering setting a tax of $0.6 per gallon of gas. Jose-Maria, a local consultant, claims "This will increase the price of gasoline that consumers pay to $10.4 a gallon".

d. Show that Jose Maria is correct. What does this imply about the price to producers?

e. Who bears the bigger tax burden? Consumers or producers? Why?

f. Is the outcome with the tax efficient? Why or why not? Find the tax revenue and the deadweight loss (if any). A clear graphical answer will ensure partial credit.

A second consultant, Jonathan, states that the full burden of the tax will fall on producers.

g. Which assumption above would you change to make his claim possible? Show graphically.

Answers:

a. Answer:

Q* = 500; P* = 10

Points: 4
Set up: 2
P* & Q*: 1 each

b. Answer: 6
CS = 2500
PS = 1250
TS = 3750

Points: 6
Graph/set up: 1 each
Numerical answer: 1 each

c. Answer:
Yes, the market is producing the efficient quantity of gasoline because at Q*
 D=MB = MC=S.
Points: 4
For understanding the MB=MC.
Note: Stating that "Maximum surplus is generated" will also get full credit,
 though it really is not as nice an answer.
If the only statement is "there is no dead weight loss": 3 points.

d. Answer:
 Ps = Pd – 0.6
By solving the system of three equations we get Pd = 10.4.
This implies the price producers receive is 9.8.

Points: 5
Numerical set up: 3 (an understanding that we have three equations)
Ps=9.8:2
Note: A graphical approach will get 3 out of 5

e. Answer:
 Consumers bear the bigger tax burden because they pay 0.4\$ more for each
 gallon of gasoline while producers receive just 0.2\$ less than before.

Points: 4
2 for understanding the concept. 2 for answer that consumers bear the bigger
 burden.

f. Answer:

   No, the outcome with the tax is not efficient because at the new equilibrium quantity Q' = 480, MB > MC.

TR = 288

DWL = 6.

   Points: 7

   Not efficient (with explanation): 1

   Finding Q: 2 (1 if graphical)

   Tax revenue: 2 (1 if graphical)

   Dead weight loss: 2 (1 if graphical)

   g. Answer:

There are two possible answers here. Either the supply is completely inelastic or the demand is completely elastic. We are looking for either of these, with a clear indication of the tax burden being fully on the producer.

   Points: 5 for either explanation.

   3 for graphing a correct case

   2 for showing that Pd does not change and Ps fall by the full tax.