

Economics 101
Homework #1
Fall 2009
Due 09/16/2009 before lecture

Directions:

- The homework will be collected in a box before the lecture.
- Place your name, TA name and section number on top of the homework (legibly).
- Late homework will not be accepted.
- It is essential that you do the homework; you can work with others but you must write up the solutions yourself.
- Please show your work.

1. Math Review

Suppose that you have two straight lines, Line A and Line B. The points $(x, y) = (2, 6)$ and $(4, 2)$ lie on Line A. The points $(x, y) = (1, 9)$ and $(3, 3)$ lie on Line B.

- Write the equations of Line A and Line B in slope-intercept form.
- Indicate the slope for each line.
- Indicate the X and Y intercepts of the straight lines.
- What is the point of intersection between Line A and Line B?
- Graph Line A and Line B.
- Suppose you are given an equation for the line $y = 2x + 5$. Furthermore, suppose you are told to write a new equation which corresponds to this first equation moving to the right horizontally by 3 units. What is the equation for this new line?

2. Production Possibility Frontier and Opportunity Cost

Bohemia is a community that produces two goods, ground beef and milk. The following table describes the production possibility frontier (PPF) for Bohemia during 2009. Assume the PPF is linear between the points listed in the table.

Points on PPF	Milk (Gallons)	Ground beef (Pounds)
A	0	100
B	10	90
C	40	0

- Draw a graph of Bohemia's PPF for 2009 based on the information contained in the table. In your graph, measure ground beef (G) on the vertical axis and milk (M) on the horizontal axis.
- Suppose Bohemia is currently producing at point B on their PPF. What is the opportunity cost of producing one additional gallon of milk?
- Suppose Bohemia is still producing at point B on their PPF. What is the opportunity cost of producing one additional pound of ground beef?

- d. If Bohemia is currently producing at combination A, what is the opportunity cost of producing 10 more gallons of milk?
- e. What is happening to the opportunity cost of producing more milk if we move from point A to point C? Explain your answer.

3. Comparative Advantage and Trade

Suppose Edith and Mary have two kinds of household chores to do every day: washing dishes and preparing meals (nothing else). Regardless of the number of dishes, it takes 1 minute for Edith and 30 minutes for Mary to wash a dish. Preparing a meal takes Edith 20 minutes but Mary 30 minutes.

- a. In one hour, how many dishes can Edith wash? How about Mary?
- b. In one hour, how many meals can Edith prepare? How about Mary?
- c. Who has the absolute advantage in washing dishes?
- d. Who has the absolute advantage in preparing meals?
- e. What is the opportunity cost of washing a dish for Edith? What about for Mary?
- f. What is the opportunity cost of fixing a meal for Edith? What about for Mary?
- g. Who has the comparative advantage in washing dishes?
- h. Who has the comparative advantage in preparing meals?
- i. Suppose they share the house chores. Who will specialize in dish washing and who will specialize in cooking?
- j. Suppose you are an economist who supports the theory of comparative advantage. Your friend Edith asks your advice in the following situation.

Situation: Edith only has 1 hour to do the house chores each day, but wants to have 3 meals and wants 10 dishes to be washed. She cannot afford to hire a housekeeper or to dine out. She has two roommates Judy and Mary and it is possible she could share the work with them. None of them will provide Edith with free service, but they are willing to exchange the work and service with one another. Furthermore, assume that they all will be happier the greater their consumption levels (e.g, a greater number of washed dishes with the same amount of meals is better than a smaller number of washed dishes with the same level of meals).

The productivity for the house chores are described as follows:

	Edith	Judy	Mary
Prepare a meal	20 minutes	20 minutes	30 minutes
Wash a dish	1 minute	1 minute	30 minutes

Assume everybody has 1 hour available each day to devote to these household tasks.

Can Edith have 3 meals and 10 clean dishes every day? Pick your answer from options I) - III) and then explain briefly why you have chosen that answer.

- I) It is possible if she shares the work with Mary.
- II) It is possible if she shares the work with Judy.
- III) There is no way for Edith to achieve her goal.

4. Comparative Advantage and Trade

Suppose Ann and Drew are doing Biology and Math homework. In one hour, Ann can solve 10 Biology questions or 20 Math questions, or any other combination lying on the straight line between these two points. In the same amount of time, Drew can solve 4 Biology questions or 16 Math questions, or any other combination lying on the straight line between those two points.

If they were to trade with each other, what is the price range (in terms of number of Math problems) acceptable to both Ann and Drew for a Biology question?