Economics 102
Spring 2010
Home Assignment #1
Due 2/3/10 at lecture

Directions: The homework will be collected in a box **before** the lecture. Please place your name, TA name and section number on top of the homework (legibly). Make sure you write your name as it appears on your ID so that you can receive the correct grade. Please remember the section number for the section **you are registered,** because you will need that number when you submit exams and homework. Late homework will not be accepted so make plans ahead of time. **Please show your work.** Good luck!

Problem 1.
Find the intersection of the two lines, described by the following equations:
$$x + y = 10$$
$$y = 2x - 5$$

Problem 2.
(a) Find the equation of the line which goes through the origin and the point (2,8).
(b) Find the equation of a line that has a y-intercept of -5 and is parallel to the line you found in part (a).

Problem 3.
A farm in Madison produces two goods, milk and corn. The farm's production possibilities frontier can be represented as a straight line where corn is measured on the X axis and milk is measured on the Y axis. The points (2, 10) and (4, 6) are on the farm's linear PPF.
(a) What is the slope-intercept form of the straight line that expresses the farm's PPF?
(b) Assume this farm is producing on its PPF. How many units of milk will the farm produce if it produces 3 units of corn?
(c) Assume this farm is producing on its PPF. How many units of corn will the farm produce if it produces 0 units of milk?

Problem 4.
Two waitresses, Mary and Lucy, can either serve tables or clean windows. Their abilities are illustrated in the following table. Assume both of them can work up to 10 hours a day. If they work less than 10 hours assume the unused time has no value. Assume Mary and Lucy do not trade with each other.

	Tables/hour	Windows/hour
Mary	6	3
Lucy	6	1

(a) Graph separately the PPFs for Mary and Lucy respectively (for one day with 10 hours of work). Measure tables (T) on the X axis and windows (W) on the Y axis. Assume the PPFs are linear between the points listed in the table. Label your PPFs carefully and completely.

Now assume both Mary and Lucy are producing on their PPFs.
(b) What is the opportunity cost of serving one more table for Mary?
(c) What is the opportunity cost of cleaning one more window for Lucy?
(d) Who has the absolute advantage in cleaning windows?
(e) Who has the comparative advantage in cleaning windows? Who has the comparative advantage in serving tables?

Problem 5.

In one day in the US, it takes 40 workers to produce a car and 15 workers to produce a computer. In one day in Japan, it takes 20 workers to produce a car and 10 workers to produce a computer. Both countries have 60 workers available each day. Assume that both PPFs are linear with respect to these two goods.

(a) Draw the PPF of each country (for one day's worth of production). Measure computers on the Y axis and cars on the X axis. Label your PPFs carefully and completely.
(b) Which country has an absolute advantage in car production? Which country has an absolute advantage in producing computers?
(c) What is the opportunity cost of producing a car in the US? What is the opportunity cost of producing a computer in the US?
(d) What is the opportunity cost of producing a car in Japan? What is the opportunity cost of producing a computer in Japan?
(e) Which country has a comparative advantage in car production? Which country has a comparative advantage in producing computers?
(f) Suppose the countries trade with each other. What is the range of possible car prices (in terms of computers)?

Problem 6.

John Lennon and Paul McCartney both write songs. Each spends 72 hours a week on this business. It takes John 4 hours to write a text or 3 hours to compose a tune, whereas Paul needs 6 hours to write a text or 2 hours for a tune.

(a) Find the equations of the PPFs of both songwriters and depict them with tunes on the y-axis and texts on the x-axis.
(b) What is the opportunity cost of writing a text for John (in terms of tunes)? What is the opportunity cost of writing a text for Paul?
(c) Who has an absolute advantage in writing texts? Who has an absolute advantage in composing tunes?
(d) Would John and Paul benefit from specialization? Explain your answer fully.
(e) If Mick Jagger needs 12 hours to write a text and 4 hours to compose a tune, will he benefit from cooperation with Paul? Explain your answer fully.