

Economics 101
Homework #1
Spring 2009
Due 02/03/2009 in lecture

Directions: The homework will be collected by your TA 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!

1. Math Review

Let the horizontal axis be the X variable and the vertical axis be the Y variable. There are two points. At point **A**, X has a value of 2 and Y has a value of 2 and at point **B**, X has a value of 4 and Y has a value of 6.

Draw a straight line passing through both points.

- Give the equation of that line.
- Indicate the slope of the line and the X and Y intercepts of that straight line.
- Now consider another straight line: $Y = 7 - X$. Draw this second line in your graph. (The same graph that has the first line.)
- Solve algebraically for the intersection of these two lines and compare the result with the graph you drew in question (c).

2. Production Possibility Frontier and Opportunity Cost

A factory of 500 workers produces footballs and basketballs. Each worker could produce either 20 footballs or 10 basketballs per day.

- Draw the PPF for this factory's production per day and label it PPF_1 . In your graph, place the number footballs on the x-axis and the number of basketballs on the y-axis. (Hint: It is a straight line.)
- Find the equation of the PPF.
- Find the opportunity cost of 1 basketball.
- Find the opportunity cost of 1 football.
- Is there a relationship between the opportunity cost and the slope of the PPF? If yes, what is the relationship?
- Describe the differences between a linear PPF and a PPF that is bowed-outwards from the origin using the concept of opportunity cost.
- Suppose the workers invent a new method to produce footballs. With the implementation of the new method, each worker can produce 30 footballs per day instead of 20. Draw the PPF and label it PPF_2 . Find its equation. What does this

example suggest about the relationship between the PPF and technological improvements?

3. Comparative Advantage

Suppose Linda and Jack are doing Biology and Economics homework. In one hour, Linda can solve 10 Biology questions and 0 Economics questions, or 20 Economics questions and 0 Biology questions, or any other linear combination lying on the line between those two points. In the same amount of time, Jack can solve 20 Biology questions and 0 Economics questions, or 30 Economics questions and 0 Biology questions, or any other linear combination lying on the line between those two points.

- a. What is the opportunity cost of solving 1 Economics question for Linda? What is the opportunity cost of solving 1 Economics question for Jack?
- b. What is the opportunity cost of solving 1 Biology question for Linda? What is the opportunity cost of solving 1 Biology question for Jack?
- c. Who has the absolute advantage in doing Biology homework? Who has the absolute advantage in doing Economics homework?
- d. Suppose that Jack and Linda work together. Who will specialize in solving Biology problems and who will specialize in solving Economics problems?
- e. If they were to trade with each other, what is the price range (in terms of the number of solved Economics problems) acceptable to both Linda and Jack for a solved Biology question?