Economics 102
Summer 2015
Homework #1
Due Thursday, June 25, 2015

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. Late homework will not be accepted so make plans ahead of time. **Please show your work (in fact, you WILL NOT receive full credit for the assignment unless you DO show your work).** Good luck!

Please realize that you are essentially creating "your brand" when you submit this homework. Do you want your homework to convey that you are competent, careful, and professional? Or, do you want to convey the image that you are careless, sloppy, and less than professional. For the rest of your life you will be creating your brand: please think about what you are saying about yourself when you do any work for someone else!

1. This set of questions is meant as a quick review of some algebra and basic math skills. If you find this set difficult, you may need to do some math review in preparation for the class.

a. Suppose you are given two points (x, y) = (3, 5) and (10, 8). Suppose these two points sit on a straight line. Write an equation in slope intercept form given these two points. Show your work. Don't worry if you get "ugly numbers": keep your numbers as fractions, and not decimals!

b. Suppose you are given two points (x, y) = (4, 8) and (12, 24). Suppose these two points sit on a straight line. Write an equation in slope intercept form given these two points and call this Line 1. Suppose you are then told that there is a Line 2 that has the following relationship to Line 1: for every x value, Line 2's y-value is twice the y-value found on Line 1. Sketch a graph of Line 1 and Line 2 and then write an equation for Line 2 given this information. As always, show your work. Graph these equations only in the first quadrant (that is, X is greater than or equal to 0 an Y is greater than or equal to 0).

c. Suppose you know that a straight line has slope of -5 and also contains the point (x, y) = (10, 5). Write an equation in slope-intercept form given this information. Show your work.

d. Suppose you know that a straight line has slope of ½ and also contains the point (x, y) = (34, 17). Write an equation in slope-intercept form given this information. Show your work.

e. Suppose you are given the equation Y = 4X + 3 and told that for every x value on this line, that the y value has increased by 10 units. Draw a graph illustrating these two lines given this information and then write an equation for the new line given this information. Show your work.

2. More math practice! Here is a second set of questions to work through for some basic math skill review.

a. You are given two equations:

Equation 1: $Y = 10X + 20$

Equation 2: $Y = 10 – 2X$

What are the (X, Y) values for where these two lines intersect? In your own words, explain what it means when these two lines intersect. As always, show your work. Don't be surprised if you get "ugly numbers" here: just keep your answers in fractions!

b. You are given two equations:

Equation 1: $Y = 10X + 20$

Equation 2: $X = 2Y – 10$

Are both of these equations in slope intercept form? Explain your answer. In the second equation, what does the numeric value "2" signify? In the second equation, what does the numeric value of (-10) signify? Use these two equations to find the values of X and Y that make both equations true. Expect "ugly numbers" and use fractions (no decimals, and no calculators here!).

c. Suppose you are given an equation $Y = 10 + 4X$. Calculate the area under this equation for all positive values of X greater than 2 and less than 4. Show your work and include a graph to illustrate your answer. Consider only the area found in the first quadrant. Assume that Y is measured as dollars per unit and X is measured as units: what type of units will the area you calculate be measured in given this information? Show your work!

3. Bernie stays confused about percentages and he is struggling to figure out what he needs to do on his final exam in Chemistry in order to get the B he needs. Here is the information he has: he scored a 40 out of a possible 50 points on his first midterm in the class; he scored a 15 out of 25 points on the second midterm (it was tough!) and on the third midterm he got an 85 out of a 100 points. He knows that his final will have 50 points. And, he also knows that each midterm has equivalent weight to all the other midterms and that this weight is 20% of his final grade; he also knows that the final exam will be weighted as 40% of his final grade; and to get a B in the class he knows that his total weighted average must be at least an 84 on a 100 point scale. So, what score will Bernie need to make on that final exam if he is going to get a B in the class? Show your work! Here you will find it helpful to work in decimals instead of fractions: try to do this without a calculator though!

4. Suppose Bert and Ernie make cookies (C) and pies (P). The table below provides information about the amount of labor time that it takes them to make one cookie or one pie. Assume that there are no other resources involved in the making of cookies and pies and that both Bert and Ernie have linear production possibility frontiers.

	Number of Hours of Labor Needed to Make One Cookie	Number of Hours of Labor Needed to Make One Pie
Bert	½ Hour of Labor	1.5 Hours of Labor
Ernie	¾ Hour of Labor	1 Hour of Labor

a. Suppose that Bert and Ernie each have 6 hours of labor that they can use to produce Cookies and Pies. Draw a graph that represents Bert's PPF measuring cookies on the vertical axis and pies on the horizontal axis. Draw a second graph that represents Ernie's PPF measuring cookies on the vertical axis and pies on the horizontal axis. Then, write an equation for Bert's PPF in slope intercept form and an equation for Ernie's PPF in slope intercept form.

b. Suppose that the number of hours of labor available to both Bert and Ernie changes so that they each have twelve hours of labor that they can use to produce cookies and pies. How will this affect the PPFs you drew in (a)? Write the new equations for Bert and Ernie's PPFs using this new level of labor.

c. Suppose that Bert and Ernie decide to specialize and then trade with one another. What good should Bert produce? Explain your answer fully.

d. Suppose that Bert and Ernie each have twelve hours of labor available to produce cookies and pies. Construct their joint PPF in a graph making sure to identify all intercepts and the coordinate values of all kink points.

e. For each of the following combinations determine whether Bert and Ernie can produce the combination (feasible or infeasible) and whether the combination is efficient or inefficient. Complete the tables by entering your answers. Base your analysis on the joint PPF you constructed in (d).

Combination of (pies, cookies)	Feasible or Infeasible?	Efficient, inefficient, or Beyond the PPF?
(30, 4)		----
(12, 24)		
(15, 18)		
(21, 12)		---

f. Given your work in this problem, provide a range of acceptable trading prices for 5 pies. Use the number line approach used in class to illustrate this trading range and include the directional arrows depicting how Bert views this transaction as well as how Ernie views this transaction.

g. Given your work in this problem, provide a range of acceptable trading prices for 3 cookies. Use the number line approach used in class to illustrate this trading range and include the directional arrows depicting how Bert views this transaction as well as how Ernie views this transaction.