Economics 102
Summer 2017
Homework #1
Due 6/1/17

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!

Please remember to

- Staple your homework before submitting it.
- Do work that is at a professional level: you are creating your "brand" when you submit this homework!
- Not submit messy, illegible, sloppy work.

1. This set of questions will help you review some basic algebra, the slope-intercept form, finding a solution given two linear equations, and finding a new equation based upon an initial equation that has undergone a change. Each question below is independent of the other questions in the set.

a. You are given two pairs of coordinates that have a linear relationship. The two pairs of coordinates are (x, y) = (20, 40) and (30, 10). You are asked to find the equation for the line that these two points lie on.

b. You are given two pairs of coordinates that have a linear relationship. The two pairs of coordinates are (x, y) = (7, 14) and (14, 28). You are asked to find the equation for the line that these two points lie on.

c. You are given two equations:

Equation 1: $w = 50 + 2z$

Equation 2: $w = 60 - 3z$

Find the (z, w) solution that represents the intersection of these two lines.

d. You are given two equations where P is the variable measured on the y-axis (this is like our renaming y to be "P") and Q is the variable measured on the x-axis (this is like our renaming x to be "Q"):

Equation 1: $P = 48 - 2Q$

Equation 2: $P = 24 + 4Q$

i. Find the (Q, P) solution that represents the intersection of the given lines.

Now, you are also told that equation 1 has changed and now the Q value is 24 units smaller at every P value than it was initially.

ii. Write the equation that represents the new Equation1'.

iii. Given the new Equation 1' and Equation 2, find the (Q', P') solution that represents the intersection of these two lines.

2. The price of money is called the interest rate. Suppose that when the interest rate is 6%, the demand for money is $14,000 and when the interest rate is 10% the demand for money is $10,000. Assume the relationship between the quantity of money demanded (Q) and the interest rate (r) is linear.
a. Draw a graph representing the above information. In your graph measure Q on the horizontal axis and r on the vertical axis.
b. Write an equation for this relationship in slope-intercept form.

3. Veronica's wealth on June 30, 2014 was $30,000. On June 30, 2015 her wealth was equal to $36,000. On June 20, 2016 her wealth was $30,000. Use this information to answer this next set of questions. For this set of questions assume there was no inflation during this three year period of time.
a. What was the percentage change in Veronica's wealth between June 30, 2014 and June 30, 2015?
b. What was the percentage change in Veronica's wealth between June 30, 2014 and June 30, 2016?
c. What was the percentage change in Veronica's wealth between June 30, 2015 and June 20, 2016?
d. Given that in both (a) and (c) you are measuring percentage changes and the numbers in both examples use $30,000 and $36,000, do you get the same answers? Explain your answer.

4. Marco, Hans, and Ruby produce brownies (B) and cookies (C). They all have linear production possibility frontiers. Marco knows that he can produce (C, B) = (20, 30) and (30, 15). Hans know that the maximum amount of brownies he can produce is 40 and the maximum amount of cookies he can produce is 10. Ruby knows that she must give up two cookies for every brownie she produces. Ruby is currently producing 16 brownies and 8 cookies.
a. Using the above information answer the following questions assuming that each individual is producing on their production possibility frontier.
    i. When Marco produces 51 brownies, his cookie production must equal ____.
    ii. When Marco produces 36 cookies, his brownie production must equal ___.
    iii. When Hans produces 3 cookies, his brownie production must equal ____.
    iv. When Hans produces 14 brownies, his cookies production must equal ____.
    v. The equation for Ruby's PPF can be written as _____.
b. For Marco, the opportunity cost of producing an additional 4 brownies is equal to _____.
c. For Hans, the opportunity cost of producing an additional 4 cookies is equal to _____.
d. Who has the comparative advantage in producing brownies? Who has the comparative advantage in producing cookies? Explain your answer.
e. Construct Marco, Hans, and Ruby's joint PPF measuring cookies (C) on the horizontal axis and brownies (B) on the vertical axis.
f. Write the equation and the range for each segment of the joint PPF.

g. Use the number line approach to illustrate the acceptable range of trading prices in terms of cookies for one brownie for Marco, Hans and Ruby. Be thoughtful here! Label your answer clearly and completely.