**Economics 102**

**Summer 2016**

**Homework #1**

**Due Thursday, June 23, 2016**

**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 lie on a linear relationship. The two pairs of coordinates are (x, y) = (20, 15) and (5, 6). 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 lie on a linear relationship. The two pairs of coordinates are (x, y) = (4, 8) and (20, 10). You are asked to find the equation for the line that these two points lie on.

c. You are given two equations:

Equation 1: y = 100 + 2x

Equation 2: y = 52 – 2x

Find the (x, y) 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 = 64 + 2Q

Equation 2: P = 196 – 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 18 units bigger 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 supply of money is $1000 and when the interest rate is 10% the supply of money is $5000. Assume the relationship between the quantity of money supplied (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. Angel’s income in 2012 was $60,000 and her income in 2013 was $75,000. Her income in 2014 was $60,000. 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 Angel’s income in 2013 relative to 2012?

b. What was the percentage change in Angel’s income in 2014 relative to 2013?

c. Given that in both (a) and (b) you are measuring percentage changes and the numbers in both examples use $60,000 and $75,000, do you get the same answers? Explain your answer.

4. The following table provides data on the amount of labor Marco and Wenqi need in order to produce widgets (W) and gadgets (G). Assume that both Marco and Wenqi have linear production possibility frontiers and that the production of widgets and gadgets requires only labor as an input. In your answer measure widgets on the vertical axis and gadgets on the horizontal axis.

|  |  |  |
| --- | --- | --- |
|  | Labor Needed to Produce One Gadget | Labor Needed to Produce One Widget |
| Marco | 3 Hours of Labor | 5 Hours of Labor |
| Wenqi | 2 Hours of Labor | 4 Hours of Labor |

a. Assume that Marco and Wenqi each have 120 hours of labor they can devote to gadget and widget production. (Note: 120 is conveniently divisible by 2, 3, 4, and 5!) Fill in the following statements given this information. Assume both Marco and Wenqi produce at points on their PPFs.

i. When Marco produces 10 gadgets, his widget production must equal \_\_\_\_\_\_\_\_\_.

ii. When Marco produces 20 gadgets, his widget production must equal \_\_\_\_\_\_\_\_\_.

iii. When Wenqi produces 8 gadgets, his widget production must equal \_\_\_\_\_\_\_\_\_.

iv. When Wenqi produces 16 gadgets, his widget production must equal \_\_\_\_\_\_\_\_\_.

b. For Marco, the opportunity cost of producing an additional 2 gadgets is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

c. For Wenqi, the opportunity cost of producing an additional 4 gadgets is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

d. Marco has the comparative advantage in the production of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Wenqi has the comparative advantage in the production of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Explain your answer.

e. Construct Marco and Wenqi’s joint PPF measuring gadgets (G) on the horizontal axis and widgets (W) on the vertical axis.

f. The acceptable range of trading prices for 10 gadgets is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Depict this acceptable range of trading prices using the number line approach presented in class.