Economics 102

Name \_\_\_\_\_

Show your work and present your work clearly and neatly!

1. Use the following graph to answer this question. The graph shows a joint PPF for Bob and Jane who both produce apples and oranges. You are told that Bob has the comparative advantage in producing apples.



a. (1 point) Given the above graph, are the following points feasible, inefficient, or not feasible?

i. (18 oranges, 15 apples)

ii. (19 oranges, 10 apples) \_\_\_\_\_

#### Answer:

Summer 2016

Quiz #2 with Answers

i. (18 oranges, 15 apples) \_\_\_\_\_Not feasible\_\_\_\_\_\_ ii. (19 oranges, 10 apples) \_\_\_\_\_ Inefficient\_\_\_\_\_

First find the equations for the two segments of the joint PPF:

For apples greater than or equal to 20 and less than or equal to 25, A = 25 - (1/3)O where A is apples and O is oranges.

For apples less than or equal to 20, A = b - 20. Then, plug is either (O, A) = (15, 20) or (25, 0) into the equation to solve for the value of b. Thus, 20 = b - 2(15) or b = 50. The equation for this lower segment is therefore A = 50 - 20.

If O = 18, then we need to use the second equation. If O = 18, what is A? A = 50 - 2(18) = 14. So, when O = 18 then the maximum number of apples that can be produced is 14. The point (O, A) = (18, 15) lies beyond the PPF: it is not feasible.

If O = 19, then we need to use the second equation. If O = 19, what is A? A = 50 - 2(19) = 12. So, when O = 19 then the maximum number of apples that can be produced is 12. The point (O, A) = (19, 10) lies inside the PPF: it is inefficient.

b. (1 point) What is Bob's opportunity cost of producing an additional four apples? Be sure to provide a unit of measurement in your answer!

### Answer:

Bob's PPF is the following (recall that Bob has the comparative advantage in producing apples!):



From the PPF we can see that Bob's opportunity cost of producing one orange is 2 apples. So his opportunity cost of producing one apple is 1/2 orange. Therefore his opportunity cost of producing 4 more apples is 2 oranges.

c. (1 point) What is Jane's opportunity cost of producing an additional three oranges? Be sure to provide a unit of measurement in your answer!

### Answer:

Jane's PPF is the following (recall that Bob has the comparative advantage in producing apples!):



From the PPF we can see that Jane's opportunity cost of producing one orange is 1/3 apple. (So her opportunity cost of producing one apple is 3 oranges.) Therefore her opportunity cost of producing 3 more oranges is 1 apple.

2. (2 points) [Multiple Choice Question here!] Suppose that you know that the market for good Y is initially in equilibrium. Then, you are told that the number of firms in the industry that produce good Y decrease while at the same time people's incomes increase in this economy. Given this information, which of the following statements is true:

a. We know with certainty that the equilibrium price of good Y is indeterminate irrespective of whether good Y is a normal or an inferior good.

b. We know with certainty that the equilibrium price of good Y is indeterminate if good Y is an inferior good.

c. We know with certainty that the equilibrium quantity of good Y is indeterminate irrespective of whether good Y is a normal or an inferior good.

d. We know with certainty that the equilibrium price of good Y is indeterminate if good Y is a normal good.

## Answer:

This is a challenging question! You should draw a sketch of the situation if the good is normal and a sketch of the situation if the good is inferior.

If the good is normal: then the supply curve shifts to the left and the demand curve shifts to the right: relative to the initial equilibrium, the equilibrium price will increase and the equilibrium quantity will be indeterminate.

If the good is inferior: then the supply curve shifts to the left and the demand curve also shifts to the left: relative to the initial equilibrium, the equilibrium price will be indeterminate and the equilibrium quantity will decrease.

3. (2 points) Consider a market in which there are ten consumers of the good. Five of these consumers have identical demand curves that can be expressed as follows:

Individual demand curve: P = 10 - Q

An additional five consumers have identical demand curves that can be expressed as follows: Individual demand curve': P = 5 - Q

In these equations P is the price per unit and Q is the quantity of units demanded. Given this information, what is the equation for the market demand curve? Make sure you identify the relevant domain or range for the market demand curve.

# Answer:

To see this answer you will want to do some sketching perhaps!



The market demand requires that you add horizontally the two sub-market demands:



Now, all you need to do is write the equations and their ranges or domains. P = 10 - (1/5)Q for Q  $\leq$  25 and P = 7.5 - (1/10)Q for Q  $\geq$  25

4. Consider the small, closed economy of Utopia's market for gadgets. The following equations give you the domestic demand and domestic supply curves for this market where P is the price per gadget and Q is the quantity of gadgets:

Domestic Demand for Gadgets: P = 100 - 2Q

Domestic Supply of Gadgets: P = 20 + 3Q

You are also told that the world price of gadgets is \$32 per gadget.

Suppose this market is open to trade while at the same time an import quota of 15 units is imposed. Given this information and holding everything else constant, answer the following questions. Show your work so that Anton can see how you found your answer!

i. (1 point) How many gadgets will be demanded in Utopia with this policy?

ii. (1 point) How many gadgets will be supplied domestically in Utopia with this policy?

iii. (1 point) What will be the value of consumer surplus in Utopia with this policy?

# Answer: Start with an image here:



At Pworld, the quantity demanded domestically is 34 and the quantity supplied domestically is 4: imports are therefore equal to 30 units.

With the import quota you have:

(quantity supplied domestically with the import quota) + (import quota) = (quantity demanded domestically with the import quota)

Replace using the given equations to get:

[(1/3)P - (20/3)] + 15 = 50 - (1/2)P

2P - 40 + 90 = 300 - 3P

5P = 250

P =\$50 per gadget with the import quota



Now, we are ready to provide answers to the questions:

i. (1 point) How many gadgets will be demanded in Utopia with this policy? \_\_\_\_25 gadgets\_\_\_\_\_

ii. (1 point) How many gadgets will be supplied domestically in Utopia with this policy? \_10 gadgets\_\_\_\_\_

iii. (1 point) What will be the value of consumer surplus in Utopia with this policy? \_\_\_\_CS = (1/2)(100 - 50)(25) = \$625\_\_\_\_\_