Problem Sets 5

1. Modeling Market Exchange: Biwei has six apples but Alex has none. Their marginal use values of apple are shown in the table below. Suppose this apple market only consists of Biwei and Alex.

Quantity of Apples	Biwei's Marginal Use Value	Alex's Marginal Use Value
1	$1.00	$2.00
2	$0.90	$1.60
3	$0.80	$1.20
4	$0.70	$0.80
5	$0.60	$0.40
6	$0.50	$0.00

1) Define use value and exchange value of an apple. If Alex's marginal use value of apples is greater than the exchange value, what will he do in the apple market as implied by the economic postulate?
2) Based on the table, draw Alex's demand curve and Biwei's demand curve for apples, respectively. [Hint: set the marginal use value of an apple equal to the price in the demand schedule.]
3) Derive the market demand curve based on Alex's and Biwei's demand curves drawn above. To simplify the process, just draw the curve in a price range from $0.5 to $1.
4) Based on Biwei's demand curve for apple, draw the supply curve of apple in this economy. [Hint: Biwei is the only supplier in the market and he would sell when EV>UV.]
5) Describe how this apple market reaches equilibrium when quantity bought and sold are balanced. What are the equilibrium price and quantity exchanged?

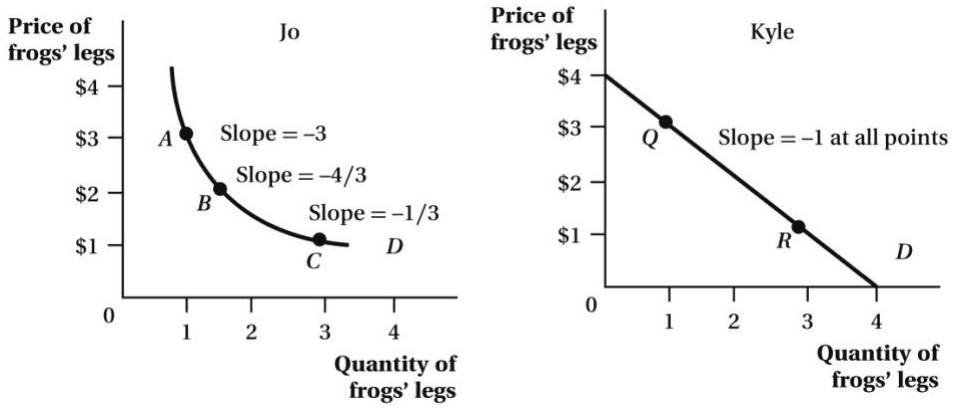
2. Consumption Budget Constraints and Production Possibilities Frontier

1) Biwei can either produce either four units of apple or six units of banana per hour. In total, Biwei works 8 hours a day. Derive the equation for Biwei's daily production possibilities frontier. If Biwei splits his total time equally into producing both goods, how many units he would produce?
2) Suppose the unit price of apple is $3 and the unit price of banana is $2, Biwei's daily income is $96. Derive Biwei's daily consumption budget constraint (CBC). If Biwei split his income equally on the consumption of two goods, what would be the quantities of the goods he can consume?
3) In the market place, what is the opportunity cost of getting an apple in terms of banana? What is the slope of Biwei's CBC? What are the answers if the unit price of apple rises to $4? What would be the quantity of the goods Biwei will consume?
4) What is the difference between the PPF and CBC? Under what condition would they be identical?

3. Given Biwei's utility function U=4XY, where X is consumption of beer and Y is consumption of pizza. For this utility function, the marginal utility of X is $MU_X = 4Y$; the marginal utility of Y is $MU_Y = 4X$.

1) Suppose Y = 3. Calculate Biwei's utility for X = 2, 3, 10, and 11. For a given level of Y, does good X display diminishing marginal utility?
2) Suppose X = 3. Calculate Biwei's utility for Y = 2, 3, 10, and 11. For a given level of X, does good Y display diminishing marginal utility?
3) Find three different bundles containing X and Y that give Biwei 48 units of satisfaction. Plot the three bundles and connect them with an indifference curve. What happens to the marginal rate of substitution between X and Y as consumption of X increases?
4) Does the principle of diminishing MRS depend on the diminishing marginal utility of X and Y?
5) What would be Biwei's optimal consumption bundle given his CBC 100=X+Y?

4. The Laws of Demand: Jo has an inverse demand for frogs' legs given by P=3/Q, while Kyle's inverse demand for frogs' legs is given by P=4-Q. Graphs of each consumer' demand curve shown below.



1) What would happen to Jo's and Kyle's demand curves when the price of drumstick goes up?
2) What would happen to Jo's demand curve when his income goes up?
3) At the price of $4, what are the quantities demanded facing Jo and Kyle?
4) At the price of $1, what are the quantities demanded facing Jo and Kyle?
5) How does the aggregate demand curve look like, taking into account both Jo and Kyle?
6) If there are only two units of frogs' legs available in the market, how many will be sold to Jo and Kyle, separately? At what prices?
7) If there are only three units of frogs' legs available in the market, how many will be sold to Jo and Kyle, separately? At what prices?
8) If there are only four units of frogs' legs available in the market, how many will be sold to Jo and Kyle, separately? At what prices?