ECO 401-002, 003
Spring 2013
Problem Set #2

KEY

Due: Wednesday, February 6

3 pts.

1. Draw this picture and briefly explain what is wrong with it. Mad Max is asked to reveal his preferences for several bundles. Bundle A consists of 5 Clothing and 2 Food. Bundle B consists of 4 Clothing and 4 Food. Bundle C consists of 2 Clothing and 5 Food. Max is indifferent between A and B, but prefers C to A.

5 pts.

2. Draw representative indifference curves, U_1 and U_2, with $U_1 > U_2$, for each of the following two sets of goods:
   a) Hamburgers and hot dogs (the consumer likes both and has diminishing MRS).
   b) Pepsi-Cola and Coca-Cola (the consumer is not able to distinguish between the two and is unaffected by brand image advertising).
   c) Peanut butter and jelly (the consumer likes exactly 2 ounces of peanut butter with every ounce of jelly on her peanut butter and jelly sandwiches).
   d) Nuts (which the consumer neither likes nor dislikes) and ice cream (which the consumer likes).
   e) Apples (which the consumer likes) and radishes (which the consumer dislikes).

4 pts.

3. Marsha consumes only two goods, xylophones and yakburgers. Her utility is given by the function $U(X, Y) = X^{.5}Y^{.5}$. Graph the indifference curve associated with a level of utility equal to 20. Identify five specific bundles of X and Y that lie on this indifference curve. Calculate the marginal rate of substitution between these bundles and show that $MRS_{X,Y}$ is diminishing as you move down the indifference curve.

4 pts.

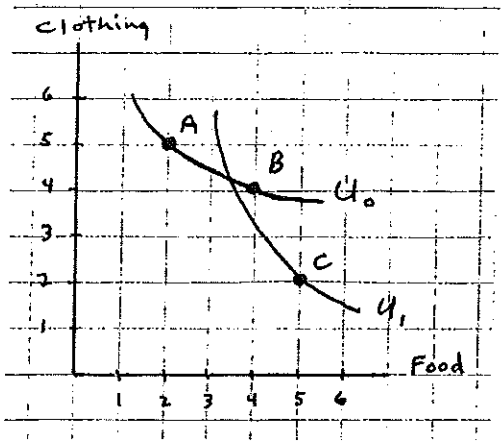
4. Raoul works on a farm and is paid in chickens. He gets 10 chickens per week in wages. The only other good produced in his country's economy is corn, so his initial consumption bundle is 10 chickens and zero bushels of corn. His marginal rate of substitution at this initial bundle is 2 chickens for 1 bushel of corn. In the market place the going rate of barter is 1 chicken for 1 bushel of corn. Illustrate Raoul's initial situation by drawing his budget constraint and the indifference curve that passes through his initial consumption bundle. Is Raoul maximizing utility at this bundle? If not, explain how Raoul will barter in the marketplace to change the amounts of chicken and corn he consumes, and illustrate the bundle that maximizes his utility.

4 pts.

5. Homer finally gets fired from his job once and for all. His spirit broken, he sits around the house all day and does nothing. His wife Marge decides that she will earn money by taking in and doing other people's laundry. As a result of her labor, the household's income is \$500 per month. Under these conditions, the Simpson family chooses to consume 400 units of food (P_F = \$0.50 per unit) and 300 units of other goods (P_{OG} = \$1.00 per unit).
   a) Illustrate the Simpsons' situation with a budget constraint and indifference curve diagram.
   b) Suppose the Simpsons qualify for a food stamp program whereby they are given coupons that can be redeemed for 600 units of food, but cannot be used to purchase other goods. While they consider themselves better off than before, they would have preferred to be given the cash equivalent and be allowed to spend it as they wish. Illustrate their new situation in your diagram.

20 pt. total

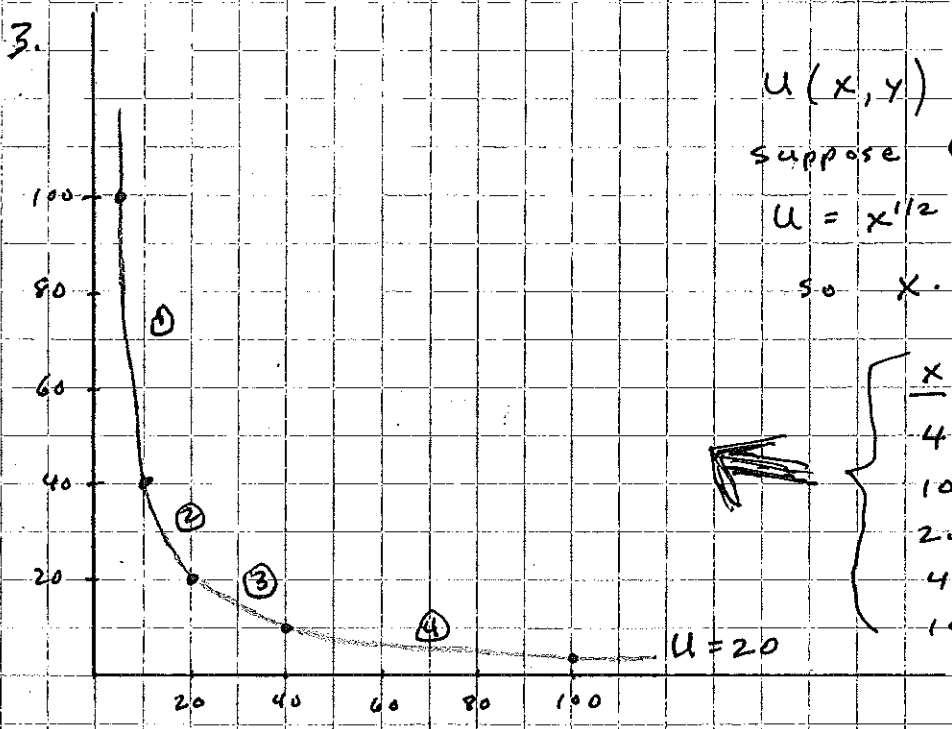
1.



Bundles A and B are equally preferred and thus lie on the same indifference curve. The only way for bundle C to lie on a higher indifference curve than A is if the indifference curves intersect or if the consumer has an increasing and not diminishing MRS between food and clothing.

2. (see next page)

3.



$U(x,y) = x^{1/2} y^{1/2}$

suppose $U = 20$

$U = x^{1/2} y^{1/2} = 20$

so $x \cdot y = 400$

x	y	U
4	100	20
10	40	20
20	20	20
40	10	20
100	4	20

① $MRS_{x,y} = -\left.\frac{\Delta y}{\Delta x}\right|_{U=20} = \frac{60}{6} = 10$

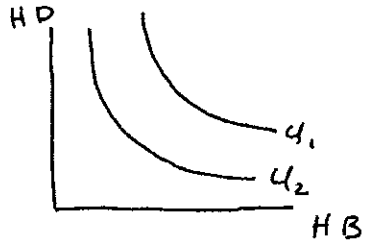
② $MRS_{x,y} = -\frac{\Delta y}{\Delta x} = \frac{20}{10} = 2$

③ $MRS_{x,y} = -\frac{\Delta y}{\Delta x} = \frac{10}{20} = \frac{1}{2}$

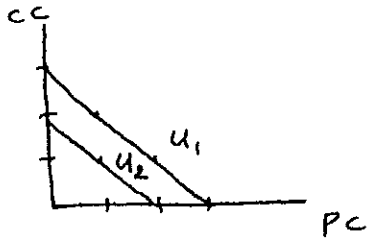
④ $MRS_{x,y} = -\frac{\Delta y}{\Delta x} = \frac{6}{60} = \frac{1}{10}$

$MRS_{x,y}$ is diminishing

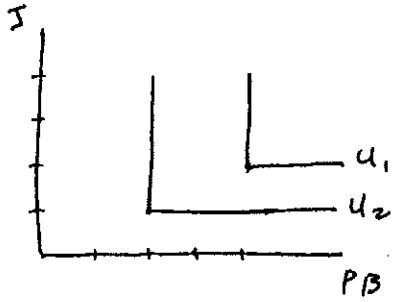
2. (a) hamburgers and hot dogs:



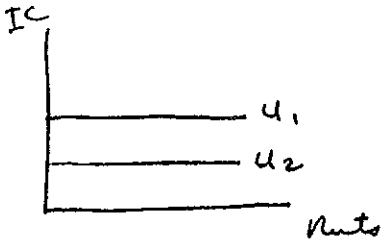
(b) Pepsi-Cola and Coca-Cola:



(c) Peanut butter and jelly:

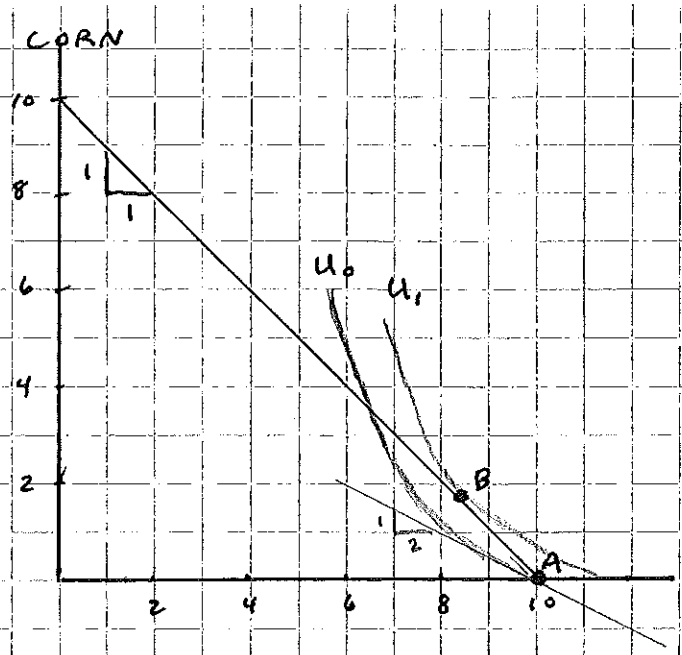


(d) Nuts and ice cream:



(e) Apples and radishes:

4.



A: initial bundle

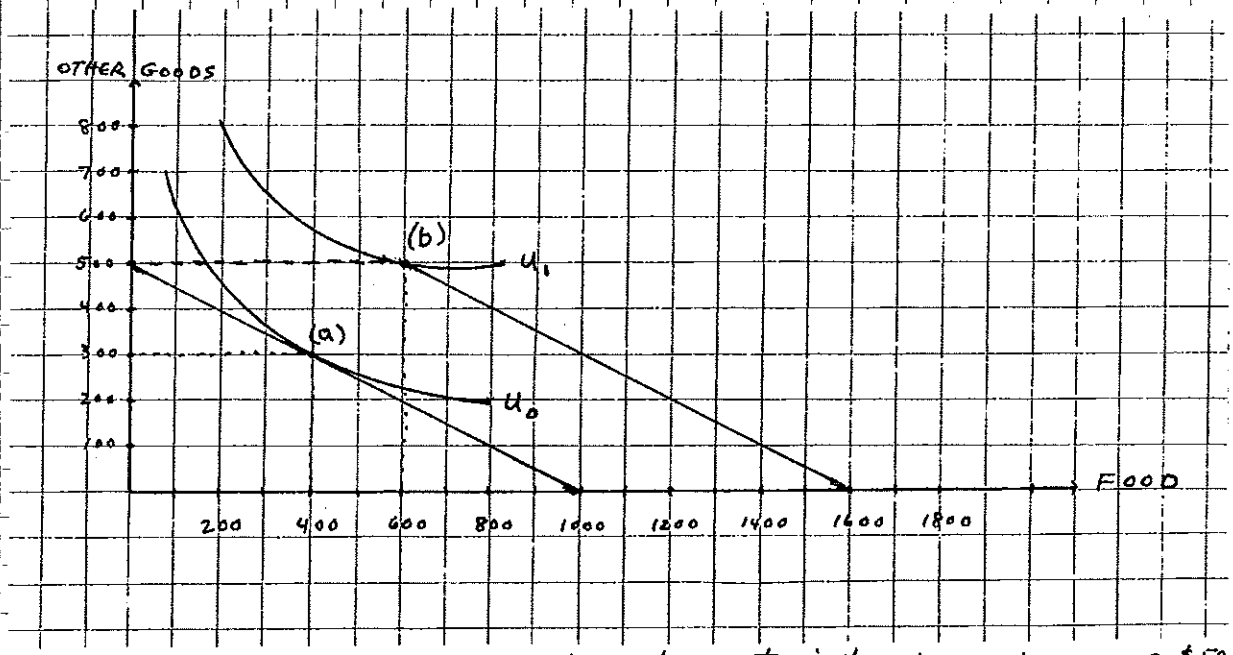
$$MRS_{X,Y} = 1/2 < \frac{P_X}{P_Y} = \frac{1}{1}$$

B: utility maximizing bundle

$$MRS_{X,Y} = \frac{P_X}{P_Y}$$

Raoul can increase his utility by trading chickens for corn.

5.



(a) The Simpson's original budget constraint given income = $500. They maximize utility by consuming F=400 and OG=300.

(b) The Simpson's new budget constraint is kinked. They can consume F=0, OG=500, or F=600, OG=500, or F=1600, OG=0. If they had been given cash income of $300 (600 units of food x $.50/unit) on top of their $500 income, their budget constraint would be a straight line. They would have preferred the cash if their preferences are as illustrated in (b) above. [See textbook p.68 Fig. 3.16]