Econ 301: Assignment 2

Winter 2017

1. State whether each of the following statements are True or False. In each case provide explanations for your decision. Full marks will depend only on the explanations that you provide:
   (2 * 3 = 6 points)
   a. Suppose Luke's preference can be represented by a utility function. After a price drop, Luke's utility goes from 50 to 100. This means that Luke is twice as happy now.

   False: We can say that after the price drop Luke is better off as his utility has increased. But we cannot make any conclusions regarding exactly how much happier he is. We simply look at the direction of change of utility, not the magnitude.

   b. Jack consumes bread and meat. As his income goes up he increases his consumption of meat whereas reduces his consumption of bread. To Jack, bread is an example of an inferior good and meat is an example of a normal good.

   True. As income increases quantity demanded for bread goes down. So bread is an inferior good. As income goes up, quantity demanded of meat goes up. So meat is a normal good.

   c. Connie consumes only Coffee and Cookies. She always takes one cookie with one cup of coffee. If the price of coffee goes up, Connie's utility must fall.

   True: Coffee and Cookies are perfect complements for Connie. If the price of coffee goes up, she will drink less coffee and thus also less cookie. Since she will consume less of both goods, her utility will fall.

2. A consumer consumes two goods: milk (good 1) and "all other goods" (good 2). Her utility function is $u(x1, x2) = x2 + \ln x1$. Suppose her income is $m = 20$. The prices are $p1 = 5$ and $p2 = 1$.

   a. What kind of preferences does the consumer have? Illus- trate the shape of her indifference curves. (3 points)

   The consumer has quasi-linear preferences.

   b. What is her optimal consumption bundle? (Hint: use the tangency condition $MRS = -p1/p2$.) (3 points)

$$\frac{\partial u}{\partial x_1} = \frac{1}{x_1}$$

$$\frac{\partial u}{\partial x_2} = 1$$

$$MRS = -\frac{1}{x_1}$$

$$-p_1 / p_2 = -5$$

At the optimal :

$$-1/x_1 = -5$$

$$x_1 = 1/5$$

$$5x_1 + x_2 = 20$$

From the budget line we have:

$$5*(1/5) + x_2 = 20$$

$$x_2 = 19$$

c. Suppose her income is now increased to m^r = 30. What is her new consumption bundle now? (2 points)

$$x_1 = 1/5$$

$$x_2 = 29$$

3. Given the demand function, determine whether Good 1 is a normal/inferior good; ordinary/giffen good; and complement/substitute good to Good 2. (6 points)

a. $x_1(p_1, p_2, m) = \frac{m}{2p_1 + p_2}$

b. $x_1(p_1, p_2, m) = \frac{m^{1/2} p_2^{1/3}}{p_1^{2/3}}$

A.

<u>Normal/inferior</u>: $\frac{\partial x1}{\partial m} = \frac{1}{2p1+p2} > 0$***; if m goes up, x1 goes up. The relationship is NORMAL.***

<u>Ordinary/Giffen</u>: $\frac{\partial x1}{\partial p1} = -2m(2p1 + p2)^{-2} < 0$***; if P1 goes up, x1 goes down. The relationship is ORDINARY.***

<u>Complement/Substitue</u>: : $\frac{\partial x1}{\partial p2} = -m(2p1 + p2)^{-2} < 0$***; if P2 goes up, x1 goes down. The relationship is COMPLEMENTS.***

B. <u>Normal/inferior</u>: $\frac{\partial x1}{\partial m} = -2/3p1\text{^}\left(-\frac{1}{3}\right)m\text{^}\left(\frac{1}{2}\right)p2\text{^}(\frac{1}{3}) < 0$***; if m goes up, x1 goes up. The relationship is NORMAL.***

<u>Ordinary/Giffen</u>: $\frac{\partial x1}{\partial p1} = -2m(2p1 + p2)^{-2} < 0$***; if P1 goes up, x1 goes down. The relationship is ORDINARY.***

<u>Complement/Substitue</u>: : $\frac{\partial x1}{\partial p2} = 1/3p2\left(-\frac{2}{3}\right)m\text{^}\left(\frac{1}{2}\right)p1\text{^}(-\frac{2}{3}) > 0$***; if P2 goes up, x1 goes down. The relationship is SUBSTITUTE.***

<u>If without doing the differentiation, students show the right relationships with proper explanation, they will get full marks</u>. For correct differentiation, but wrong conclusion, only partial marks will be given.***