Intermediate Microeconomics Exercise Class 4

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Content

Multiple Choice

⋆1. Suppose Fiori spends all his income on brownies and hotpots, then which of the following situation is plausible?

A. Both brownies and hotpots are inferior goods.

B. Both brownies and hotpots are luxuries.

C. Brownies are neither inferior goods nor luxuries, and hotpots are inferior goods.

D. Brownies are luxuries, and hotpots are neither inferior goods nor luxuries.

Recall: Definitions of inferior goods, normal goods and luxury goods.

Multiple Choice

2. Other things being equal (the initial price, quantity demanded, etc.), the lower the magnitude of own-price elasticity of demand,

A. the less likely the profitability of a price increase.

B. the more likely the profitability of a price increase.

C. the greater the responsiveness in quantity demanded to a price change.

D. the lower the corresponding increase in firm revenue

Recall: The relationship between revenue(profit) and own-price elasticity of demand.

Multiple Choice

3. Poorer countries have a _____ demand for wheat because they usually _____.

A. less elastic; find other substitutes.

B. less elastic; can't find other substitutes.

C. more elastic; can't find other substitutes.

D. more elastic; find other substitutes

Recall: Factors that influence the elasticity of demand.

Multiple Choice

$\star$ 4. Recent research estimates that the short-run price elasticity of demand for gasoline in the U.S. is -0.3, and the long-run price elasticity of demand is -1.4. What happens if the government increases the federal gasoline tax?

A. Consumer expenditures on gasoline increase in the short-run and long-run

B. Consumer expenditures on gasoline decline in the short-run and increase in the long-run.

C. Consumer expenditures on gasoline increase in the short-run and decline in the long-run.

D. Consumer expenditures on gasoline decrease in the short-run and long-run.

Recall: Relationship between expenditures and elasticity.

Multiple Choice

$\star$ 5. A demand function is given as

$$log(Q_x) = a - b * \log(P_x) + c * \log(P_y) + d * \log(M),$$

where P_x is the price of the good x, P_y is the price of a second good y and M is income. Suppose a, b, c, d are positive numbers, then the second good y must be

A. a normal good.

B. an inferior good.

C. a substitute for the good x.

D. a comlement for the good x.

Recall: Factors that influence elasticity of demand.

HW1Q6

6.Suppose the demand of Fiori for brownies has a constant elasticity of $-\epsilon(\epsilon > 0)$:
1) Suppose $\epsilon = 1$ and Fiori purchases 10 brownies when the price is 1. Derive the demand function and the inverse demand function for him.
2) If the price of brownie increases, will Fiori spend more or less purchasing it? (Do not assume $\epsilon = 1$ here)

HW1Q6 Cont'd

HW1Q7

7. Fiori wants to buy coffee and bread. The price of coffee and the quantity purchased are given as P_1 and Q_1. Similarly, P_2 and Q_2 correspond to bread. Simplify the notation with (P_1, Q_1, P_2, Q_2). Fiori buys the goods according to the following rule

$$P_1 Q_1 + P_1 Q_2 + P_2 Q_1 + P_2 Q_2 = 4$$

Fiori's purchase yesterday was $(1, 1, 1, 1)$.
1) If the price of coffee increases by 10% today and the price of bread is unchanged, Fiori still buys one unit of bread. What is the arc price elasticity of demand for coffee?
2) If the price of coffee and the amount of bread purchased are held constant, what is the cross-price elasticity of demand for coffee with respect to the price of bread at the point of $(1, 1, 1, 1)$?

HW1Q7 Cont'd

HW1Q8

8. The theoretical model we discussed in class shows that a producer can maximize the revenue by setting the price at the point of unit-elastic demand. However, in reality we observe that producers frequently adjust prices. Explain why producers may alter prices over time rather than keeping the price constant.

HW1Q8 Cont'd

Preference, Utility and Indifference Curve

- Utility 效用
  - Ordinal Utility 序数效用: monotonic transformation
  - Cardinal Utility 基数效用
- Marginal Utility 边际效用: law of diminishing marginal utility
- Marginal Rate of Substitution 边际替代率: $\frac{dY}{dX} = -\frac{MU_X}{MU_Y} = MRS_{XY}$.
- Indifference Curve 无差异曲线 :
  $U(X, Y) = C$. (convex, Average $\succeq$ Extreme)
- Three Methods to Maximize Utility Under Budget Constraint
  - Analysis Viewpoint
  - Geometry Viewpoint
  - Economics Viewpoint

Utility Maximization

Question 1

For lunch, Ada prefers to eat soup and bread in fixed proportions. When she eats X pints of soup, she prefers to eat $\sqrt{X}$ ounces of bread. If she has X pints of soup and more than $\sqrt{X}$ ounces of bread, she eats all the soup along with $\sqrt{X}$ ounces of bread, and throws the extra bread away. If she has X pints of soup and fewer than $\sqrt{X}$ ounces of bread (say Y ounces), she eats all the bread along with Y^2 ounces of soup and throws the extra soup away.

a) Draw Ada's indifference curves between soup and bread.

b) Assume she spends all her income M on soup and bread and each ounce of soup or bread costs \$1. Derive her demand function for the two goods. [Note that demand function is a function of prices and income].

c) Plot her income-consumption curve for soup and bread. Also show the proportion of income she spends on each good.

Question 2

Gary has two children, Kevin and Dora. Each one consumes "yummies" and nothing else. Gary loves both children equally. For example, he is equally happy when Kevin has two yummies and Dora has three, or when Kevin has three yummies and Dora has two. But he is happier when their consumption is more equal.

a) Draw Gary's indifference curves.

b) What would they look like if he loved one child more than the other?

c) Suppose that Kevin starts out with two yummies and Dora with eight yummies, and that Gary can redistribute their yummies. Draw a "budget line" that shows his available choices and indicate his best choice by adding indifference curves.

d) How would your answer differ if Kevin started out with six yummies and Dora with four?

Question 3

You spend your monthly income on food (good 1) and books (good 2). The average price of food is constant at $p_1 = 1$. On the other hand, to encourage reading, the local bookstore runs a limited promotion: every month, the first four books you buy cost $p_2 = 1$ each, and after that books cost $p_2 = 4$ each. Your preferences are given as follows: for any two bundles $A = (x_1, x_2) > 0$ and $A' = (x_1', x_2') > 0$,

$$A \succsim A' \iff \frac{x_1}{x_1'} \geq \frac{x_2'}{x_2}.$$

a) Derive your monthly budget set and plot it in a clearly labeled graph.
b) Derive your individual demand (for both goods) as a function of income m, $x_1^*(m)$ and $x_2^*(m)$.

Thanks!