

Name: _____

Economics 100A

TA _____

Midterm Spring 2007

Multiple Choice: Circle the correct answer directly on the page. Each question is worth 3 points.

1. Identify the truthfulness of the following statements.

I. The substitution effect is unambiguous in its direction.

II. Direction of the income effect depends on whether the good is a normal or an inferior good.

A) I is true; II is false.

B) Both I and II are true.

C) I is false; II is true.

D) Both I and II are false.

2. Suppose the price of A is \$2, the price of B is \$3, and the consumer's income is \$50. Which of the following baskets is not on the consumer's budget line?

A) $A = 5, B = 5$

B) $A = 10, B = 10$

C) $A = 4, B = 14$

D) $A = 8, B = 11.33$

~~3. Suppose the cross-price elasticity for two goods is negative. The two goods are~~

A) Complements.

B) Normal goods.

C) Inferior goods.

D) Substitutes.

4. Marginal utility is

A) Always less than average utility.

B) Always greater than average utility.

C) The slope of a ray from the origin to the total utility function.

D) The slope of the total utility function.

5. If a consumer is unable to compare two baskets, then this consumer's preferences violate which of the following key assumptions?
- A) Both completeness and transitivity.
 - B) Completeness.
 - C) Transitivity.
 - D) More is better.
6. Along a linear demand curve, as price falls
- A) The elasticity is the same as the slope of the demand curve.
 - B) The elasticity of demand increases.
 - C) The elasticity of demand is constant.
 - D) The elasticity of demand falls.
7. If indifference curves intersect, this violates the assumption that preferences
- A) Are transitive.
 - B) Have a diminishing marginal rate of substitution.
 - C) Are complete.
 - D) Require that more is better.
8. The concept of equivalent variation means
- A) The income effect.
 - B) The change in income necessary to hold the consumer at the final level of utility as price changes.
 - C) The substitution effect.
 - D) The change in income necessary to restore the consumer to the initial level of utility as price changes.
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9. The theory of consumer choice
- A) Describes how a consumer chooses between different income levels.
 - B) Describes how a consumer allocates her limited preferences among available income levels.
 - C) Describes how a consumer chooses between different budget constraints.
 - D) Describes how a consumer allocates her limited income among available goods and services.
10. Which of the following is the best example of a firm's objective function?
- A) Both a) and b) are correct.
 - B) To engage in ethical behavior.
 - C) To maximize profits.
 - D) To minimize costs.

* if Giffen and int. good: +1

Short Answer (5 points each)

1. Does economic theory require that a demand curve be downward sloping? If not, under what circumstances might the demand curve have an upward slope over some regions?

2 pts. → does not require

↑ full explanation

Generally speaking demand curves are downward sloping. Economic theory, however, suggests a special case of an inferior good whose negative income effect is greater than its positive substitution effect. In this event, consumption of the good falls when the price of the good falls. This type of good is known as a Giffen good. While economic theory suggests that such a good could exist, in practice no such good has been confirmed for humans (although the text suggests an experiment on rats where a good was determined to be a Giffen good).

* if decrease Giffen good but not name it, +1

2 * Giffen good
1 more for (inc. effect outweighs subst. eff.)

2. At an optimum interior basket, why must the marginal utility per dollar spent on all goods be the same?

At an interior optimum, the slope of the budget line must equal the slope of the indifference curve. This implies

2 pts, slope BL = slope

indiff. curve

$$MRS_{x,y} = \frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

This can be rewritten as

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

need to explain why first is

1 Pt

which is known as the "bang for the buck" condition. If this condition does not hold at the chosen interior basket, then the consumer can increase total utility by reallocating his spending to purchase more of the good with the higher "bang for the buck" and less of the other good.

2 Pts

3. In most situations, it is reasonable to make three assumptions about consumer preferences. What are they?

Completeness,
Transitivity
More is better

①
①
①

if explain? max. satisfied 2 pt. = 1

wrong get 4

2 Bonus Pts.

if not answered at all: still 2 Pts.

4. Explain why the price elasticity of demand for an entire product category (such as yogurt) is likely to be less negative than the price elasticity of demand for a typical brand (such as Dannon) within that product category.

If the prices for a particular product, such as Dannon, within a product category changes (say it increases) then it is easy for a consumer to switch to another brand, implying a relatively high percent change in quantity demanded for the product. On the other hand, if prices for the entire product category change, substitutes are not as easily found and the percent change in quantity demanded for the category will be relatively lower. This implies the elasticity for the entire product category will be higher (less negative) than the elasticity for a single product.

5 or nothing

if realize that
category is

more inelastic
→ ex. explain it

Problems (12 points each) If you are running out of time, be sure to describe how you would proceed on the problem.

1. You are given the following information:
 - a. Price elasticity of demand for cigarettes at current prices is -0.2 .
 - b. Current price of cigarettes is $\$0.10$ per cigarette.
 - c. Cigarettes are being purchased at a rate of 10 million per year.

Find the linear demand curve that is consistent with this information.

$$b = -\epsilon_d \frac{Q^*}{P^*}$$

6 pts for formula

$$b = -.2 \left(\frac{10,000,000}{.1} \right) \\ = 20,000,000$$

$$Q_d = a - bP$$

$$10m = a - 20m \left(\frac{1}{10} \right)$$

$$12m = a$$

$$Q^d = 12,000,000 - 20,000,000P$$

3 pts for identify
D-equation

3 pts calculation

if b : correct +2
 a : correct +1

#s of zeroes wrong : -1

3. Olivia likes to eat both apples and bananas. At the grocery store, each apple costs \$0.20 and each banana cost \$0.25. Olivia's utility function for apples and bananas is given by $U(A,B) = 6\sqrt{AB}$. If Olivia has \$4 to spend on apples and bananas, how many of each should she buy to maximize her satisfaction? Draw a graph to illustrate this situation.

Use the tangency condition to find the optimal amount of A to relative to B.

4 pts: $\frac{MU_A}{P} = \frac{MU_B}{P}$

$$\frac{3\sqrt{B/A}}{0.20} = \frac{3\sqrt{A/B}}{0.25}$$

$$15\sqrt{B/A} = 12\sqrt{A/B}$$

$$\frac{225B}{A} = \frac{144A}{B}$$

$$\frac{225B^2}{144} = A^2$$

$$A = 1.25B$$

2 pts. for optimality cond. for calculation correctly

Now plug this into the budget constraint to find the optimal amount of B to purchase.

$$0.20(1.25B) + 0.25B = 4$$

$$0.50B = 4$$

$$B = 8$$

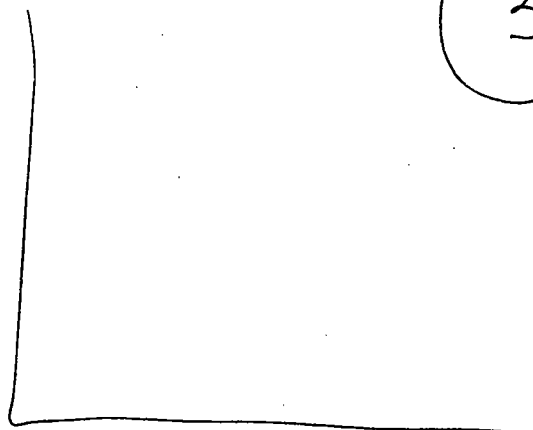
Finally, plug this result into the relationship between A and B above to determine the optimal amount of A; $A = 1.25(8) = 10$. Therefore, she should buy 10 apples and 8 bananas to maximize her utility.

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3 Graph

2 pts for interior optimum pt

1 add. what A, B are



1 for A
1 for B
1 for BC

12

4. Linda consumes two goods, X and Y. Her utility function is $U(x,y) = XY$. Initially, $P_x = \$18$ and $P_y = \$2$. Linda's income is \$288. Then the price of X falls to \$8.

a. Show algebraically how her optimal bundle of X and Y changes when the price of X changes.

For bundle A,

2. 1 pt formula
~~1 pt proof~~
1 pt right #s

$$\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$
$$\frac{Y}{X} = \frac{18}{2} = \frac{9}{1}$$
$$9X = Y$$

$$P_x X + P_y Y = I$$
$$18X + 2Y = 288$$
$$18X + 18X = 288$$
$$36X = 288$$

$$X = 8$$
$$Y = 72$$

~~Plug in BC → more Pz~~

For bundle C,

$$\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$
$$\frac{Y}{X} = \frac{8}{2} = \frac{4}{1}$$
$$4X = Y$$

$$P_x X + P_y Y = I$$
$$8X + 2Y = 288$$
$$8X + 8X = 288$$
$$16X = 288$$

$$X = 18$$
$$Y = 72$$

2 Pts

more than needed

- b. Calculate the change in the quantity of X due to the substitution effect and due to the income effect.

Basket	X	Y	$U = XY$	$\frac{MU_X}{MU_Y} = \frac{P_X}{P_Y}$	Expenditure $P_X X + P_Y Y$
A	8	72	$8 \cdot 72 = 576$	$\frac{Y}{X} = \frac{72}{8} = \frac{9}{1} = \frac{18}{2}$	$18 \cdot 8 + 2 \cdot 72 = 288$
B	12	48	$12 \cdot 48 = 576$	$\frac{Y}{X} = \frac{48}{12} = \frac{4}{1} = \frac{8}{2}$	$8 \cdot 12 + 2 \cdot 48 = 192$
C	18	72	$18 \cdot 72 = 1296$	$\frac{Y}{X} = \frac{72}{18} = \frac{4}{1} = \frac{8}{2}$	$8 \cdot 18 + 2 \cdot 72 = 288$

Solve bundle
B : 2 pts

6 pts.

2 for decomp. basket
Basket B is the decomposition basket. 8-12 is substitution effect and 12-18 is income effect.

2 inc. effect (if only explain, graph no #s => 1 Pt.)

pos. move

- c. Is this good a normal good, an inferior good or a Giffen good? How do you know?

2 pts.

It is a normal good because the income effect is positive. The quantity of x increases as income increases.

Definition: 1 Pt.

2 pts. if all explained