

ECON 310

Assignment #2

Homework Quiz: Thursday, September 18

Use the following information for problems 1-3. Alice consumes goods X and Y. Alice's utility function is given by $U=X^2*Y^3$. From this equation, we know that $MU_x= 2XY^3$ and $MU_y= 3X^2Y^2$.

1. Suppose Alice has an income of \$200, the price of X, $P_x = \$4$, and the price of Y, $P_y = \$12$.

- i. Write the equation for Alice's budget line. Draw this graphically with good Y on the y-axis and good X on the x-axis. Make sure to label the intercepts.
- ii. What is the marginal value of X in terms of Y $\{ MV_{x/y} \}$ at her optimal bundle?
- iii. What is the optimal bundle of X and Y? (Hint, use two equations: the budget constraint and the relationship between the indifference curve and budget constraint at the optimal point)
- iv. What is Alice's utility at this point?

2. Suppose Alice's income falls to \$100.

- i. Write the equation for Alice's new budget line. Illustrate this graphically on the graph from problem 1, part i.
- ii. What is the new optimal bundle of X and Y?
- iii. Is X a normal or inferior good?
- iv. What is Alice's utility at this point?
- v. Construct Alice's Engel curve for good X using these 2 levels of income.
- vi. When her income changes from \$200 to \$100, what is Alice's income elasticity of demand in this region?

3. Now, suppose the price of good X increases from \$4 to \$8, but her income stays at the original level of \$200.

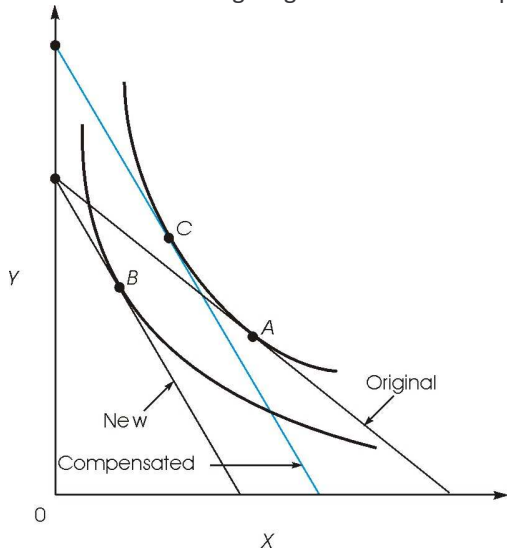
- i. Write the equation for Alice's new budget line. Draw this graphically on the same graph from problem 1, part i.
- ii. What is the new optimal bundle of X and Y?
- iii. Is X a giffen or a non-giffen good?
- iv. What is Alice's utility at this point?
- v. Construct Alice's linear demand curve for good X from these 2 points. Derive the equation and illustrate it graphically. (Note: this curve has different axes, so you will need to use a different graph than that from part i.)
- vi. What is Alice's price elasticity of demand for good X? Is Alice's demand elastic or inelastic?

4. Consider the following:

- i. Can a good have both a downward sloping Engel curve and a downward sloping demand curve? Why or why not?
- ii. Can a good have both an upward sloping Engel curve and an upward sloping demand curve? Why or why not?

5. Multiple Choice (i-xi):

Refer to the following diagram for the next 4 problems



i. When the budget line shifts from the “Original” to the “New”, the price of ____.

- A. X increases.
- B. X decreases
- C. Y increases
- D. Y decreases

ii. When the price change in the previous question occurs, the actual consumption of good X changes from ____ to ____.

- A. A to B
- B. A to C
- C. B to C
- D. C to A
- E. B to A

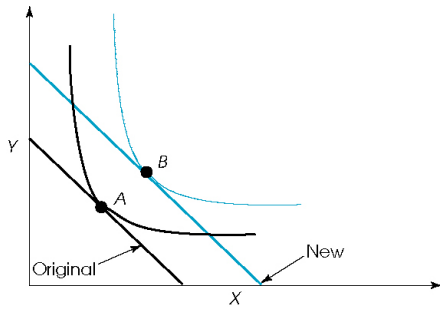
iii. The move from C to B with respect to the quantity of good X refers to the

- A. Substitution Effect
- B. Income Effect
- C. Can't tell

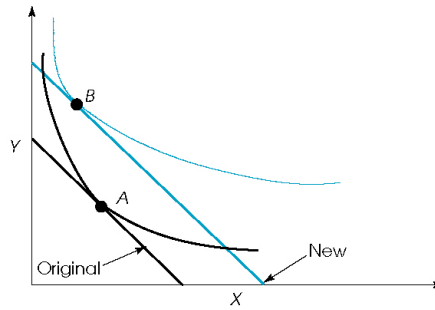
iv. In this case, X is a _____ good.

- A. Giffen
- B. Inferior
- C. Normal
- D. Leontief

Refer to the following graphs for the next two questions:



(A)



(B)

v. The good depicted in (A) is:

- A. an inferior good, so the slope of the Engel curve for this good is positive
- B. an inferior good, so the slope of the Engel curve for this good is negative
- C. a normal good, so the slope of the Engel curve for this good is positive
- D. a normal good, so the slope of the Engel curve for this good is negative

vi. The good depicted in (B) is:

- A. an inferior good, so the slope of the Engel curve for this good is positive
- B. an inferior good, so the slope of the Engel curve for this good is negative
- C. a normal good, so the slope of the Engel curve for this good is positive
- D. a normal good, so the slope of the Engel curve for this good is negative