

Module 2: Utility Theory

Practice Quiz

Multiple Choice

Identify the letter of the choice that **BEST** completes the statement or answers the question. Each question has only **ONE** correct answer. Always assume a two-good economy when relevant.

1. Which of the following does **NOT** cause the demand curve for good Y to shift to the left?
- A. Preferences for good X become stronger.
 - B. The price of good Y decreases.
 - C. The price of good X increases, and goods X and Y are complements.
 - D. Income decreases, and good X is inferior.
 - E. Both B and D.

Answer: B

2. Which of the following changes does **NOT** cause the optimal consumption bundle to change?
- A. The price of good X increases.
 - B. The price of good Y and income increase by the same amount.
 - C. The utility function changes from $U = (\sqrt{X} + \sqrt{Y})$ to $U = 10(\sqrt{X} + \sqrt{Y})^2$.
 - D. All prices and income decrease by the same percentage.
 - E. Both C and D.

Answer: E

3. If prices and income change such that the new budget line goes through the original budget line at the original optimal consumption, which of the following statements describes what happens? Assume that the MRS is always diminishing.
- A. Consumption of good X increases if the price ratio (p_X over p_Y) increases.
 - B. Consumption of good Y increases if the price ratio decreases.
 - C. The consumer moves to a higher indifference curve regardless of whether the price ratio increases or decreases.
 - D. The consumer moves to a lower indifference curve if the price ratio increases.
 - E. The consumer moves to a lower indifference curve if the price ratio decreases.

Answer: C

4. If goods X and Y are perfect complements, which of the following statements describes what happens when p_X increases but we step in and provide the consumer with the additional income to remain on the original indifference curve?
- A. Good X is now relatively more expensive than good Y .
 - B. The budget constraint becomes steeper and shifts out.
 - C. The optimal consumption bundle remains unchanged.
 - D. The new budget constraint crosses the original budget constraint at the original optimal bundle.
 - E. All of the above.

Answer: E

Fill in the missing word(s) (or drag and drop)

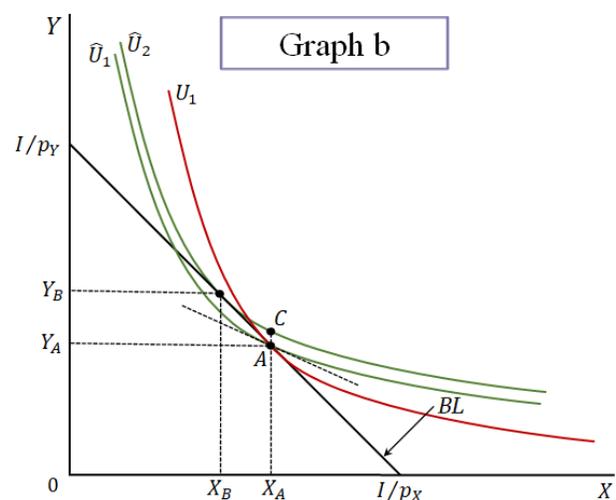
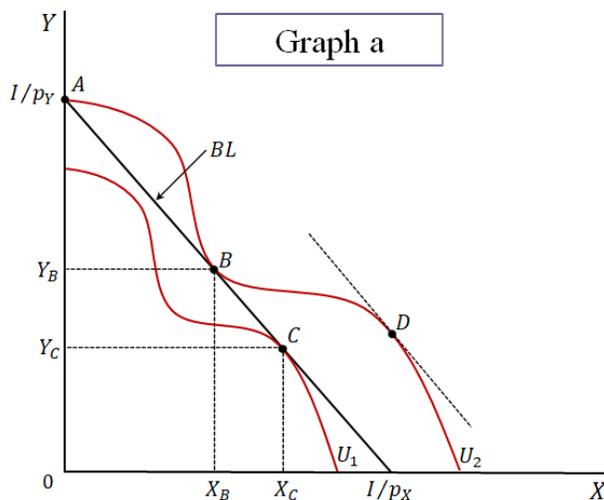
5. Fill in the blank (shaded) spaces in the table below, assuming that consumption is optimal.

X	Y	MU_X	MU_Y	MRS	p_X/p_Y	p_X	p_Y	I
10		$1/2\sqrt{X}$	$1/2\sqrt{Y}$		2	2		
			2	6	3		2	120
	20	\sqrt{Y}/\sqrt{X}	\sqrt{X}/\sqrt{Y}	1				80
10		Y		Y/X		9	3	
	50	4	1		6		1	

Answer:

X	Y	MU_X	MU_Y	MRS	p_X/p_Y	p_X	p_Y	I
10	40	$1/2\sqrt{X}$	$1/2\sqrt{Y}$	2	2	2	1	60
20	0	12	2	6	3	6	2	120
20	20	\sqrt{Y}/\sqrt{X}	\sqrt{X}/\sqrt{Y}	1	1	2	2	80
10	30	Y	X	Y/X	3	9	3	180
0	50	4	1	4	6	6	1	50

6. Refer to graphs a and b below to fill in the missing words.



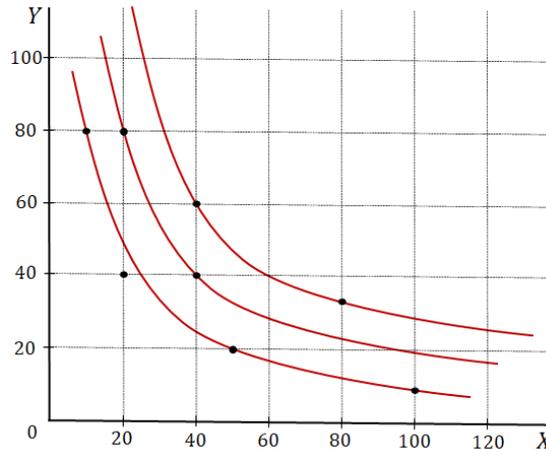
_____ (Preferences) are well-behaved in graph _____ (b) but not in graph _____ (a) as the MRS is not always _____ (diminishing) in graph _____ (a).

In graph a, the MRS_{XY} at bundle D is equal to the negative of the _____ (slope) of the BL , but bundle D is not _____ (affordable). At bundle C , the U_1 indifference curve is _____ (tangent) to the BL , but bundle C is not _____ (optimal). Instead, the _____ (optimal) bundles are bundle A and bundle _____ (B).

In graph b, the change in the _____ (optimal) bundle from (X_A, Y_A) to (X_B, Y_B) results from a change in _____ (preferences), with an increase in _____ (preferences) for good _____ (Y) as reflected in indifference curves becoming _____ (flatter).

True or False

7. For each of the following statements about Andrea’s preferences, which are depicted in the graph below, choose whether it is “true” or “false.”



a. $(60, 40) \sim (40, 60)$

- A. True
- B. False

Answer: True

b. $(40, 40) \succ (20, 80)$

- A. True
- B. False

Answer: False

c. $(20, 40) \succ (50, 20)$

- A. True
- B. False

Answer: False

d. $(100, 10) \succeq (10, 80)$

- A. True
- B. False

Answer: True

8. For each of the following statements about demand curves for goods X and Y , choose whether it is “true” or “false.”

- a. Demand for good Y increases (demand curve shifts to the right) when p_Y decreases.
- C. True
 - D. False

Answer: False

- b. Demand for good Y decreases (demand curve shifts to the left) when income decreases (assume here that good X is inferior).

- C. True
- D. False

Answer: True

- c. Quantity demanded of good X increases when p_Y increases (assume here that the two goods are complements).

- C. True
- D. False

Answer: False

- d. Demand for good X decreases when p_Y decreases (assume here that the two goods are substitutes).

- C. True
- D. False

Answer: True

Short Answer

9. Suppose that Andrea views goods X and Y as perfect substitutes. Her preferences are given by

$$U = 10X + 5Y,$$

where $MU_X = 10$ and $MU_Y = 5$, and her budget constraint is

$$5X + 10Y \leq 100.$$

Compute the optimal consumption bundle.

Answer: $X = 100 / 5 = 20$; $Y = 0$

10. Suppose that Andrea only enjoys her coffee (good X) with a cookie (good Y). She is spending the day out and has only \$9 for coffees and cookies. A cup of coffee costs \$2, while a cookie costs \$2.50. What is her optimal consumption of coffees and cookies for the day?

Answer: $X = Y = 9 / (2 + 2.5) = 2$