ECON 300: Intermediate Price Theory

Problem Set #2

Fall 2024

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Problem 1. Preferences

Suppose that you are analyzing the preference relation of some consumer.

1.A. You are told that the consumer's preference is "rational." What does this mean?

1.B. Can you think of any scenario when your own preferences are not "rational?" Describe.

1.C. You are told that the consumer's preference satisfy the axiom of convexity. What does this mean?

1.D. You are told by the consumer that "$X \succsim Y$." What does this mean?

1.E. You are told by the consumer that "$X \sim Y$." What does this mean?

Problem 2. Utility

Suppose you found a suitable utility function $U(\cdot)$ that accurately represent the consumers preference relations.

2.A. You are told that $U(X) = 100$ and $U(Y) = 20$. Based on this information alone, can you conclude that the consumer prefers bundle X 5 times more than bundle Y?

2.B. Suppose that consumer A tells you their utility from consuming X is 100, but consumer B tells you that their utility from consuming Y is 50. Does this mean that consumer A enjoys X more than consumer B enjoys X?

2.C. Suppose that a consumer tells you that "$X \succ Y$ and $Y \succsim Z$." Select all functions that are a valid utility function that represents their preferences.

Function	Utility		
$U(\cdot)$	$U(X) = 5$	$U(Y) = 5$	$U(Z) = 1$
$V(\cdot)$	$V(X) = 100$	$V(Y) = 2$	$V(Z) = 1$
$W(\cdot)$	$W(X) = 5$	$W(Y) = 4$	$W(Z) = 4$

2.D. Define in your own words the definition of "marginal utility."

Problem 2. Utility (continued)

2.E. Define in your own words the definition of "marginal rate of substitution."

2.F. Define in your own words the definition of "law of diminishing marginal utility."

2.G. Can you think of any real-world cases where the law of diminishing marginal utility is not true?

Problem 3. Indifference Curves

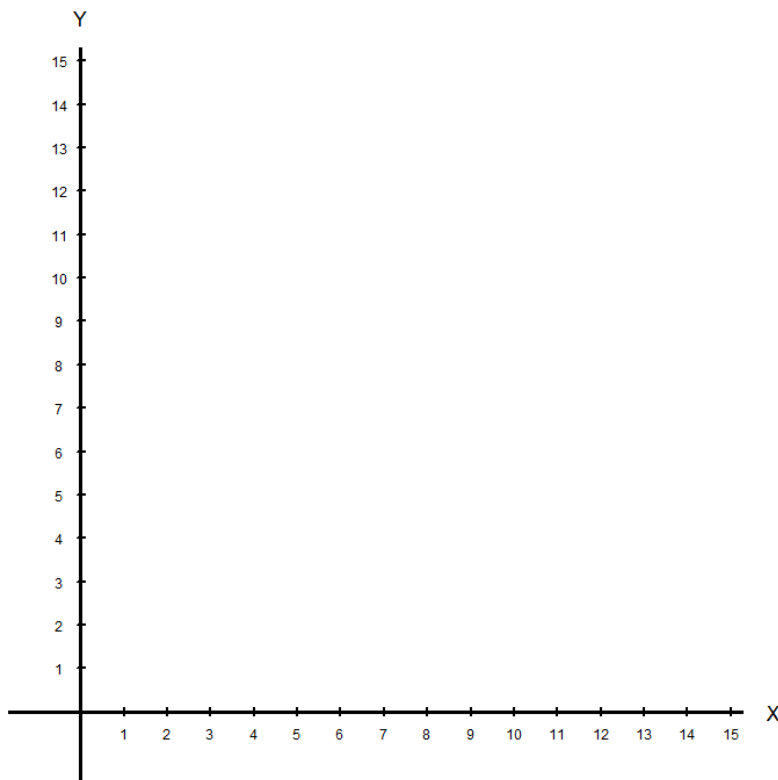Suppose a consumer's utility function is given as:

$$U(x, y) = x \cdot y$$

3.A. Identify the "type" of this utility function.

3.B. Find six bundles where the consumer's utility will be exactly 12.
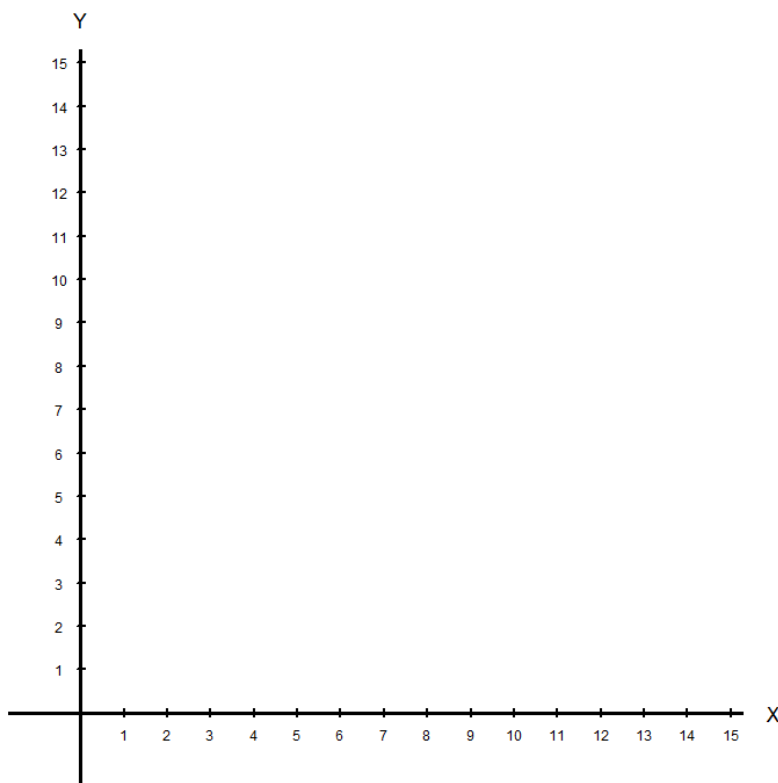(*Hint: Begin with $x = 4$ and $y = 3$.*)

3.C. Plot the points you found in 3.B. in the empty chart below.

Problem 3. Indifference Curves (continued)

3.D. Find four bundles where the consumer's utility will be exactly 8.

3.E. Plot the points you found in 3.D. in the empty chart below.

3.F. Compare your answers for 3.C. and 3.E.
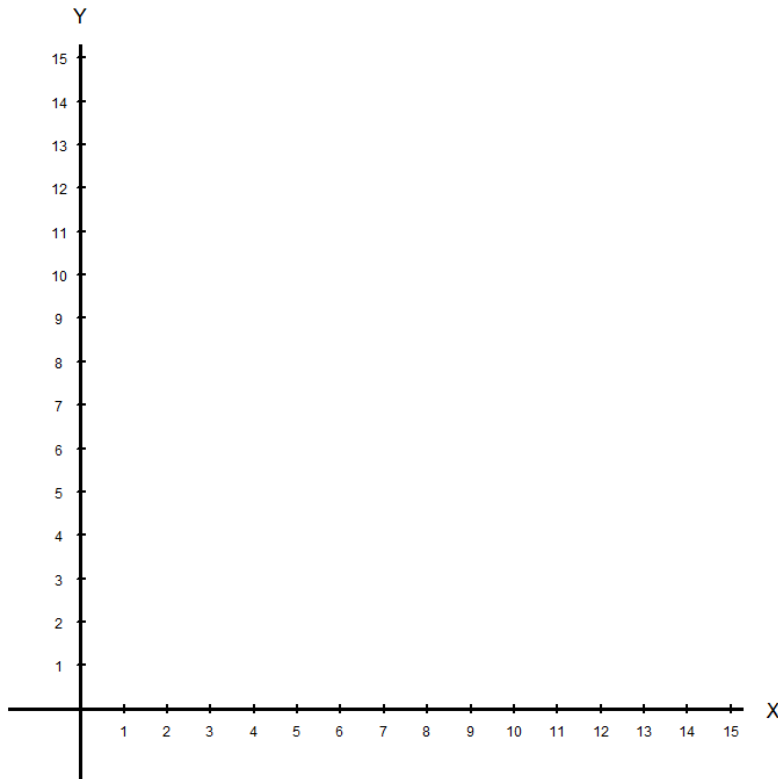
Problem 4. "Special" Indifference Curves

Suppose a consumer's utility function is given as:

$$U(x, y) = 2x + y$$

4.A. Identify the "type" of this utility function.

4.B. Find eight bundles where the consumer's utility will be exactly 14.

4.C. Plot the points you found in 4.B. in the empty chart below.

Problem 4. "Special" Indifference Curves (continued)

4.D. Calculate the slope of the indifference curve.

4.E. Calculate the marginal rate of substitution.

4.F. What does the marginal rate of substitution represent?

• Score: _____   • Extra Credit: _____