Monmouth COLLEGE

- Name: ______________________
- Date: ______________________
- Section: ______________________

ECON 300

Quiz #2

Fall 2023

INSTRUCTIONS:

- Please read all questions carefully before you begin answering.
- Answer all questions in the spaces provided on the question sheet. Circle the correct answer for the multiple-choice questions.
- This quiz consists of 7 pages, including this one. There are a total of 3 problems with a total of 13 subquestions, and two extra credit questions.
- This is a closed-book quiz. Please remove all materials from the top of the desk and take any necessary items from your bags before the exam begins.
- The recovery rate for Quiz #2 is 80%.

Problem 1. Multiple Choice (40 Points)

Suppose that A, B, and C are some commodity bundles. The consumer has a preference $\succsim$, and a utility function $u(\cdot)$ that accurately represents this preference.

1.A. Select the preference axiom that states "if $A \succsim B$, and $B \succsim C$, then $A \succsim C$" (5 points)

(a) Completeness
(b) Transitivity
(c) Strong Monotonicity
(d) Convexity

1.B. Select the preference axiom that states "consumers prefer diversity in consumption?" (5 points)

(a) Completeness
(b) Transitivity
(c) Strong Monotonicity
(d) Convexity

1.C. Which are the axioms that are required for the preference to be *rational*? (5 points)

(a) Completeness and Transitivity
(b) Completeness and Convexity
(c) Transitivity and Reflexivity
(d) Transitivity and Strong Monotonicity

1.D. If $A \succ B$, which of the following must be true? (5 points)

(a) $u(A) < u(B)$
(b) $u(A) = u(B)$
(c) $u(A) > u(B)$
(d) $u(A) \leq u(B)$

1.E. Suppose that $A \succsim B$ and $B \succ C$.
Which of the functions $U(\cdot)$, $V(\cdot)$, and $W(\cdot)$ are valid utility functions? (5 points)

Function		**Utility**	
$U(\cdot)$	$U(A) = 10$	$U(B) = 9$	$U(C) = 0$
$V(\cdot)$	$V(A) = 1$	$V(B) = 1$	$V(C) = 0$
$W(\cdot)$	$W(A) = 12$	$W(B) = 0$	$W(C) = 0$

(a) $U(\cdot)$ and $V(\cdot)$

(b) $U(\cdot)$ and $W(\cdot)$

(c) $V(\cdot)$ and $W(\cdot)$

(d) $U(\cdot)$, $V(\cdot)$, and $W(\cdot)$

1.F. What is the correct expression of the Marginal Rate of Substitution, MRS_{xy}? (5 points)

(a) $-\dfrac{MU_x}{MU_y}$

(b) $-\dfrac{P_x}{P_y}$

(c) $\dfrac{MU_x}{P_x}$

(d) $\dfrac{MU_y}{P_y}$

1.G. Which of the following is <u>NOT</u> true? (5 points)

(a) Two indifference curves from the same consumer cannot intersect.

(b) The marginal rate of substitution between goods x and y increases as the consumer moves along the indifference curve to bundles with increased amounts of good x.

(c) The slope of the indifference curve represents the consumer's subjective rate of exchange between the two goods x and y.

(d) Lexicographic preference is an example of a preference that violates the axiom of continuity.

Problem 2. Utility (30 Points)

Please answer the following questions using words, graphs, or mathematics. You may choose to rely on words alone, have a graph support your argument, or generate an example that illustrates certain points.

2.A. Explain in your own words the Law of Diminishing Marginal Utility. (10 points)

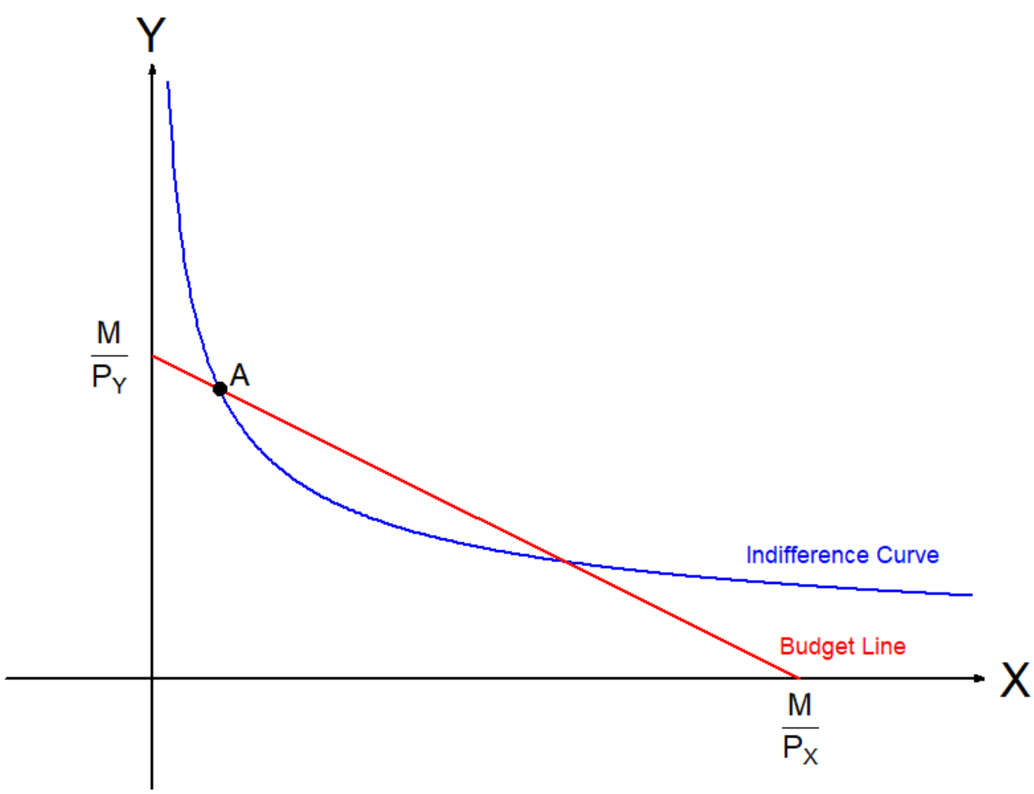
2.B. Economists consider utility to be ordinal. What does this mean? (10 points)

2.C. If two goods x and y in the market are perfect complements, what utility function would most accurately reflect the consumer's preferences? (10 points)

Problem 3. Utility Maximization (30 Points)

3.A. What does the slope of the indifference curve represent? (10 points)

3.B. Assuming that the consumer is currently consuming at bundle A, is it possible to make changes to the quantity of goods x and y to reach a higher level of utility? If so, what changes should the consumer make to increase their utility? (10 points)



3.C. Justify your verdict from question 3.B. (10 points)

Hint: Consider the meaning of each slope, and what those two being different or identical.

Problem EX. Extra Credit (10 Points)

Recall that we have the modified power rule given as:

$$\frac{\partial}{\partial(variable)}\left(constant \cdot variable^{power}\right) = constant \cdot power \cdot variable^{power-1}$$

Applying the rule above, please calculate the following partial derivatives:

- $\frac{\partial}{\partial x}(10x^2y^3)$ (5 points)

- $\frac{\partial}{\partial y}(10x^2y^3)$ (5 points)

- Original Score: ________________
- Recovered Score: ________________
- Original Date: ________________
- Recovered Date: ________________