• Name: _____

• Date: _____

CONCORDIA COLLEGE
MOORHEAD, MINNESOTA

BUSN 301: Intermediate Microeconomic Theory

Quiz #1

Spring 2026

INSTRUCTIONS:

• Each quiz is graded on a 100-point basis and contributes to your Quiz component of the course grade.

• You are expected to show all relevant steps and reasoning.

• Answers must be clearly written and well-organized.

• Graphs, when required, must be clearly labeled, with axes, curves, and key points identified.

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**Problem 1. The Budget Constraint**   **(5 Points Each)**
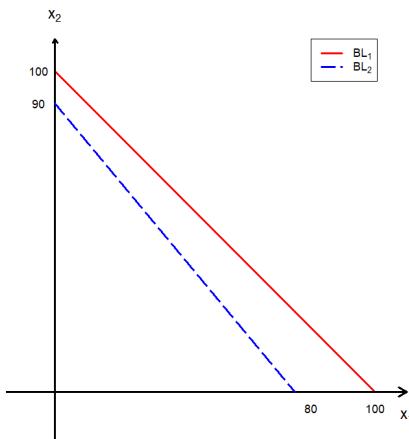
Suppose that the prices of good 1 (x_1) and good 2 (x_2) are given as $p_1 = 4$ and $p_2 = 2$, respectively. The consumer's income is $m = 40$, and the consumer allocates income across two goods only.

1.A. Express the consumer's budget line as an equation.

1.B. Calculate the slope of the budget line and interpret the slope economically in terms of trade-offs between goods.

1.C. Suppose that the price of good 2 increases from $p_2 = 2$ to $p_2 = 4$, holding income and p_1 fixed. Describe, in your own words, what happens to the budget constraint. Does it shift or pivot? Around which intercept? In which direction?

1.D. The figure below shows two budget lines, BL_1 and BL_2. Which budget line would you prefer to face, holding preferences fixed? Why?

Problem 2. Preferences and Utility   **(5 Points Each)**
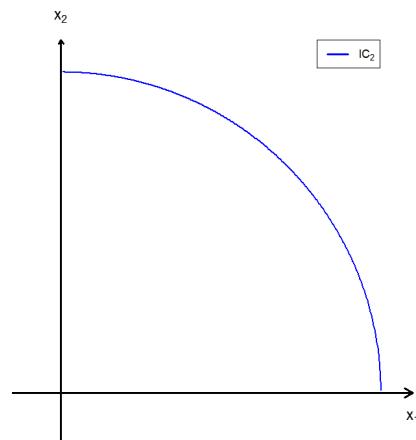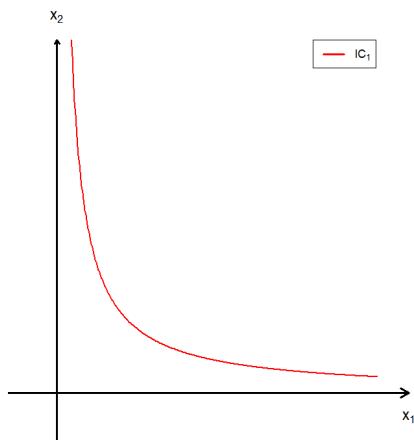
Suppose a consumer has rational preferences over two goods, x_1 and x_2.

2.A. In your own words, explain what an indifference curve represents.

2.B. Give an example of a situation in which preferences might fail to be monotone. Explain briefly.

2.C. What does it mean for a utility function to be an ordinal representation of preferences? What kinds of transformations preserve the same preferences?

2.D. The figure below shows two possible indifference curves, IC_1 and IC_2. Which indifference curve is consistent with convex preferences? Explain.

Problem 3. The Utility Maximization Problem I   **(6 Points Each)**

Suppose a consumer's preferences over two goods, x_1 and x_2, are represented by the utility function $u(x_1, x_2) = 2x_1^2 x_2$. The prices of goods 1 and 2 are given by $p_1 = 5$ and $p_2 = 10$, respectively, and the consumer's income is $m = 150$.

3.A. Compute the marginal utility of good 1 and the marginal utility of good 2.

3.B. For the purposes of this and following questions in Problem 3, assume that the marginal utilities are given by $MU_1 = 2x_2$ and $MU_2 = x_1$. Derive the marginal rate of substitution.

3.C. State the first-order condition that characterizes the consumer's optimal choice.

3.D. Write down the consumer's budget constraint.

3.E. Solve for the utility-maximizing bundle (x_1^*, x_2^*).

Problem 4. The Utility Maximization Problem II   **(6 Points Each)**

Suppose a consumer's preferences over two goods, x_1 and x_2, are represented by the utility function $u(x_1, x_2) = x_1 + 2x_2$. The prices of goods 1 and 2 are given by $p_1 = 5$ and $p_2 = 10$, respectively, and the consumer's income is $m = 150$.

4.A. Compute the marginal utility of good 1 and the marginal utility of good 2.

4.B. For the purposes of this and following questions in Problem 4, assume that the marginal utilities are given by $MU_1 = 10$ and $MU_2 = 20$. Derive the marginal rate of substitution.

4.C. State the condition that characterizes the consumer's optimal choice.

4.D. Write down the consumer's budget constraint.

4.E. Solve for the utility-maximizing bundle (x_1^*, x_2^*).

Problem 5. Extra Credit: Dual Constraints   **(5 Points)**

Suppose that a student is planning a spring break trip. They have already packed all necessary items except for two goods: sunscreen (S) and lotion (L). The student's preferences over these two goods are represented by the utility function $u(S, L) = min\{S, 2L\}$. The prices of sunscreen and lotion are given by $p_S = 8$ and $p_L = 7$, respectively, and the student's income is $m = 112$. In addition to the budget constraint, the student faces a carry-on weight restriction imposed by the airline. Each unit of sunscreen weighs $w_S = 3$, and each unit of lotion weighs $w_L = 4$. The airline's maximum allowable carry-on weight is $W = 24$. For the purpose of this problem, assume that students are allowed to purchase and carry fractional units of both sunscreen and lotion. Find the student's optimal choice (S^*, L^*).

- Original Score: _____

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