Session #2 - Budget Constraint and Utility Maximization

Jan 31, 2025

Budget Constraint

Suppose you have \$60 to spend on either good x, with a price of \$10, or good y, with a price of \$6.

(a) What is your budget constraint?

(b) If you receive an extra \$30, the new budget constraint is?

(c) If the extra \$30 is removed but the price of x decreases to \$5, your budget constraint is?

(d) Now go back to the setting in (a). Say good x offers a 50% quantity discount on extra goods purchased over 3 units. What does the budget constraint look like?

(e) Now go back to the setting in (a), but you are given a \$30 gift card for good x only. What does the budget constraint look like?

Utility Functions

Consider the following utility functions:

$$\begin{aligned} \text{(I)} \quad & u(x_1, x_2) = 4\sqrt{x_1 x_2}, \\ \text{(II)} \quad & u(x_1, x_2) = 4x_1 + x_2, \\ \text{(III)} \quad & u(x_1, x_2) = \min\{4x_1, x_2\}. \end{aligned}$$

1. What is the marginal utilities of good 1 and 2?
2. What is the MRS (marginal rate of substitution) of x_1 for x_2?
3. Plot the indifference curves.

Optimal Consumption Bundles

Given the budget constraint:

$$2x_1 + x_2 = 8,$$

calculate the optimal consumption bundles for the above 3 utility functions.