31E99906 Capstone Microeconomic Policy
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Return method: through mycourses by the deadline

Problem Set 1: Question 2

We continue with the consumer theory and measures of welfare. As in the lecture, we assume two goods x, y and their respective prices p_x, p_y. The consumer has some income M. Constant Elasticity of Substitution (CES) preferences take the form

$$u(x, y) = x^\theta y^{1-\theta}$$

where we assume $1 > \theta > 0$.

In the class we discussed, the consumer choice using pictures. Here, we want to connect the figures to the consumer choice problem using methods that you have seen earlier in your studies.

1. Let $MU_x = \theta x^{\theta-1} y^{1-\theta}$ be the marginal utility of x, and similarly $MU_y = (1-\theta) x^\theta y^{-\theta}$ for y. Marginal rate of substitution between x and y is $MRS = -\frac{MU_x}{MU_y}$. This MRS is the slope of the indifference curve. Can you explain why?

2. What is the slope of the consumer's budget line?

3. Recall that the consumer will choose to consume so that MRS equals the slope of the budget line. Use this equality to obtain the demand for good x and y as function of both prices p_x and p_y, and income M.

4. You may use numbers such as $\theta = .4$, and values for income $M = 1400$ and prices $p_x = 4, p_y = 6$ to see the impact of a changing price on demands of the goods. You may draw a figure using excel or similar program to show how the demand for both goods changes with one price such as p_x increasing to 5 and higher. Can you see the substitution effect and income effect in your figures?