Econ 3012 - Midterm Exam

October 31, 2023

1. *Briefly answer the following in a way that a person who **has not studied economics or mathematics would understand**:*

    A. Why is the relation *"is a friend of"* **not** a **transitive** relation?

    B. What is an **elasticity**?

    C. What is the **marginal rate of substitution?**

2. *Fill in the blank.*

    A. An **ordinary** good is one where demand _____ when _____ increases.

    B. If $(4,0) \succ (2,2)$ and $(0,4) \succ (2,2)$, preferences are not _____.

    C. If demand for a good is elastic then a 1% increase in the price of that good will lead to _____ decrease in demand.

3. A consumer has utility function $u(x_1, x_2) = min\left\{\frac{1}{3}x_1, x_2\right\}$. Prices are p_1 and p_2 and the consumer's income is m.

    A. What is the equation for this consumer's budget line?

    B. Sketch a few of this consumer's indifference curves.

    Suppose:
    $p_1 = 1,\ p_2 = 6,\ m = 900$

    C. What is the consumer's demand for x_2?

    D. Suppose p_2 changes to $p_2 = 12$. How much of the consumer's decrease in demand for x_2 is due to the substitution effect?

4. A consumer has endowment $\omega_1 = 5$, $\omega_2 = 5$. Their utility function is $u(x_1, x_2) = x_1 + x_2$. Assume $p_1 = 2$ and $p_2 = 4$

A. What is this consumer's budget equation?

B. What is the optimal bundle of x_1 and x_2 for this consumer?

C. In part **B**, is this consumer a borrower or a net buyer or net seller of x_1?

D. If p_1 decreases to $p_1 = 1$ is the consumer better off or worse off?

5. Three consumers have the same demand for some good x. Each has income m and the price of the good is p. Their demands are each $x = \frac{m+100}{p}$

A. What is each consumer's **income** elasticity? If a consumer's income goes up by 1% does their demand for this good go up by more than, less than, or exactly 1%?

B. What is the market demand for this good?

C. Plot the market **inverse demand**.

D. Can we use the representative consumer property for this market?