

Econ 3012 - Midterm

May 4, 2022

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

A. What is a **preference relation**?

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

C. What does it mean for someone's **price elasticity of demand** for some good to be equal to -1 ?

2. Fill in the blank:

A. A **net buyer** of a good has a gross demand for that good that is _____ than their endowment of the good.

B. If an **increase** in income makes the demand for a good **decrease**, that good is called _____.

C. A consumer **strictly prefers** the bundle $(1, 2)$ to the bundle $(2, 3)$. This consumer's preferences are **not** _____.

3. A consumer has utility function $u = x_1 + x_2$. The price of x_1 is $p_1 = 4$ and the price of x_2 is p_2 . Income is $m = 20$.

A. Write down this consumer's **budget constraint**.

B. What is the name for the type, or "family" of preferences this consumer has?

C. What is the slope of this consumer's **indifference curves**?

D. What would p_2 need to be so that the slope of this consumer's indifference curves are the same as the slope of the budget line?

E. If p_2 is lower than your answer to *Part D*, how much of **good 1**: x_1 will the consumer buy? What if p_2 is higher than your answer to *Part D*?

4. Suppose a consumer has demands: $x_1 = \frac{p_2}{p_1} * \frac{m}{p_1}$ and $x_2 = \left(1 - \frac{p_2}{p_1}\right) * \frac{m}{p_2}$
- A. Is x_1 normal, inferior, or neither?
 - B. Is x_1 ordinary, Giffen, or neither?
 - C. Plot the **Engle curve** for x_1 when $p_1 = 1$ and $p_2 = 2$. (*Make sure to label the axes*).
 - D. What is the **price elasticity** of demand for x_1 ?
 - E. Suppose $p_1 = 1$, $p_2 = 1$ and $m = 20$, what bundle does this consumer buy? If p_1 increases to $p_1 = 2$ what bundle do they buy?
 - F. How much of the change in demand for x_1 in *Part E* is due to the **substitution effect**?
5. A consumer has utility function $u = x_1x_2$ and endowment $\omega_1 = 10$, $\omega_2 = 0$. Prices are $p_1 = 1$ and $p_2 = 1$.
- A. Write down this consumer's **budget equation**.
 - B. What is this consumer's **marginal rate of substitution**?
 - C. What is this consumer's **demand for x_1** ?
 - D. Is this consumer a **net buyer** or **net seller** of x_1 ?