

# Econ 3012 - Midterm Exam

December 9, 2022

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

- A. What is a preference relation?
- B. Why can't indifference curves slope upwards when preferences are **monotonic**?
- C. What is price elasticity of demand?

2. Fill in the blank.

- A. A good that is inferior is one where demand \_\_\_\_\_ when \_\_\_\_\_ increases.
- B. If a consumer can compare every possible bundle and say they are indifferent or they strictly prefer one to the other, we say their preferences are \_\_\_\_\_.
- C. If demand for a good is inelastic then a 1% increase in the price of that good will lead to \_\_\_\_\_ decrease in demand.

3. A consumer has utility function  $u(x_1, x_2) = x_1x_2$ . 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) What is the marginal rate of substitution for this consumer?

*Suppose for the rest of this question:*

$$p_1 = 1, p_2 = 2, m = 200$$

- C) What is the consumer's demand for  $x_1$  and  $x_2$ ?
- D) About how much  $x_2$  would the consumer give up to get one more unit of  $x_1$  at the demand in part C?

4. A consumer has utility function for consumption today  $c_1$  and next year  $c_2$  of  $u(c_1, c_2) = \min\{c_1, c_2\}$ . Their income is  $m_1 = 600$  and  $m_2 = 1500$ . The interest rate is  $r$ .

- A) What is this consumer's budget equation?
- B) What is the optimal bundle of  $c_1$  and  $c_2$  for this consumer at  $r = 0.25$ ?
- C) In part **B**, is this consumer a borrower or a lender/saver?
- D) If  $r$  decreases to 0.1 is the consumer better off or worse off?

5. A consumer has demand for two goods of:  $x_1 = 5$  and  $x_2 = \frac{m-5p_1}{p_2}$  where  $m$  is income, and  $p_1, p_2$  are the prices of the two goods.

- A) Is  $x_2$  a normal or inferior good?
- B) What is the consumer's price elasticity for  $x_2$ ?
- C) What bundle does this consumer demand when  $p_1 = 10, p_2 = 2, m = 100$ ? If  $p_2$  increases to  $p_2 = 5$ , what is the new bundle the consumer demands?
- D) Of the change in demand for  $x_2$  from part **C**, how much is due to the income effect? How much is due to the substitution effect?