

Write your answers in the space provided.

1. Fill in the blanks:

- (a) (4 points) An inferior good is one for which demand _____ when _____ increases.
- (b) (4 points) A rational preference relation is one that is _____ and _____.
- (c) (4 points) A consumer's _____ measures the amount of one good they are willing to give up to get more of another.
- (d) (4 points) If a consumer prefers the bundle (3,3) to (4,4), their preferences **are not** _____.

2. Consider the following rational preference relation on the set $\{a, b, c\}$:

$$a \succsim a, \quad b \succsim b, \quad c \succsim c, \quad b \succsim a, \quad b \succsim c, \quad c \succsim a, \quad c \succsim b.$$

- (a) (4 points) Is this preference relation complete?
- (b) (4 points) Write the strict preference relation $\succ$.
- (c) (4 points) Write the indifference relation $\sim$.
- (d) (4 points) Write the preferences in chain notation.
- (e) (4 points) What is **best** from the set $\{a, b\}$?

3. A consumer has utility function $U(x_1, x_2) = 3x_1 + 2x_2$. Income is $m = 20$. Initially, prices are $p_1 = 1, p_2 = 1$.

(a) (4 points) Sketch the consumer's budget line, label the **end-points** and the **slope**.

(b) (4 points) What is the consumer's **Marginal Rate of Substitution**?

(c) (4 points) What bundle (x_1, x_2) does the consumer demand?

(d) (4 points) Suppose the price p_1 changes to $p_1 = 2$. Now what bundle (x_1, x_2) does the consumer demand?

(e) (4 points) Of the change in demand due to this price change, how much is due to the substitution effect?

(f) (4 points) Of the change in demand due to this price change, how much is due to the income effect?

4. A consumer has utility for consumption in period 1 c_1 and consumption in period 2 given by $U(c_1, c_2) = \min\{c_1, c_2\}$. Their income in period 1 is $m_1 = 1000$ and their income in period 2 is $m_2 = 2000$. The interest rate is $r = 0.5$.
- (a) (4 points) Write the consumer's budget equation.
 - (b) (4 points) How much consumption can they have in period 2 if they only consume in period 2?
 - (c) (4 points) What is this consumer's optimal choice of (c_1, c_2) ?
 - (d) (4 points) Is the consumer a borrower / saver / neither?
 - (e) (4 points) If the interest rate decreased to $r = 0.25$ is the consumer a borrower / saver / neither?
5. Suppose someone's utility function is $U(x_1, x_2) = x_1 x_2$.
- (a) (4 points) What is their Marginal rate of substitution?
 - (b) (4 points) Write down an equation that implies that the slope of the budget equation is the same as their indifference curve at the point (x_1, x_2) . (Hint: This is the "*Tangency*" condition.)
 - (c) (4 points) For this consumer, $(2, 4) \sim (4, 2)$. What is another bundle that is indifferent to $(2, 4)$ and $(4, 2)$?
 - (d) (4 points) What is the convex combination of the bundles $(4, 2)$ and $(2, 4)$ if the weight on the bundle $(4, 2)$ is $t = \frac{1}{2}$?
 - (e) (4 points) How does the bundle you found in part d compare to $(2, 4)$ and $(4, 2)$? Does this violate **convexity** or not?

6. (5 Free Points) Circle one choice below each statement. Your answer will only be used to help me improve this course and exam-writing for the rest of this semester and future offerings of this course. **Turn this page in separately from the rest of the exam. Do not write your name on it.** Please be honest.

I felt the learning objectives were clear.

Strongly Disagree Disagree Neutral Agree Strongly Agree

I felt the homework exercises helped me prepare well for the exam.

Strongly Disagree Disagree Neutral Agree Strongly Agree

I felt lecture helped me prepare well for the exam.

Strongly Disagree Disagree Neutral Agree Strongly Agree

I felt the *content* of the exam what similar to what I expected.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Relative to my expectations, I felt the *difficulty* of the exam was:

Much Harder Harder As Expected Easier Much Easier

Additional comments that could help me improve this course?

(Feel free to use back if needed.)