

ECON 4113. HOMEWORK 3 (100 POINTS).
DUE TUESDAY APRIL 3 IN CLASS.

1. (25 points) Suppose there are two goods x_1 and x_2 . The consumption set is \mathbb{R}_{++}^2 . We have one consumer with lexicographic preferences, who prefers any infinitesimal increase of x_1 to any amount of x_2 . For any price system (p_1, p_2) find the optimal consumption bundle.
2. (25 points) Revealed Preference Exercise. Set up is the same as in the previous problem. Suppose that you are given the data about the bundles that some consumer is choosing given price system (p_1, p_2) . Namely, for any (p_1, p_2) you know which bundle was chosen. Suppose that these data coincides with what you've found in the previous exercise. Can you conclude that this consumer has lexicographic preferences? Is there a preference relation on \mathbb{R}_{++}^2 that is not lexicographic, has a utility function and generates exactly the same data points you observe?
3. (25 points) Suppose \succsim is transitive and irreflexive. Prove that it is asymmetric. Hint: use proof by contradiction. (Negation of $(a \Rightarrow b)$) is equivalent to $(a$ and not $b)$:

$$\neg(a \Rightarrow b) \text{ is equivalent to } (a \wedge \neg b)$$

4. (25 points) Suppose \succsim is transitive and asymmetric. Prove that it is irreflexive.