# Seminar 1

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## 1 Jehle & Reny 1.8. Axioms of consumer choice

Sketch a map of indifference sets that are all **parallel**, **negatively sloped straight lines**, with **preference increasing north-easterly**.We know that preferences such as these satisfy Axioms 1, 2, 3, and 4.

Prove that they also satisfy Axiom 5'.

Prove that they do not satisfy Axiom 5.

### 1.1 Axiom 1. Completeness

**We can always choose**

$\forall\ x^1, x^2$ in $X$, we have: $x^1 \succsim x^2$ or $x^2 \succsim x^3$ or both

### 1.2 Axiom 2. Transitivity

### 1.3 Axiom 3. Continuity

### 1.4 Axiom 4'. Local non-satiation

### 1.5 Axiom 4. Strict monotonicity

### 1.6 Axiom 5'. Convexity

### 1.7 Axiom 4. Strict convexity

## 2 Jehle & Reny 1.9

Sketch a map of indifference sets that are **all parallel right angles that 'kink' on the line** $x_1 = x_2$. If **preference increases north-easterly**, these preferences will satisfy Axioms 1, 2, 3, and 4'.

Prove that they also satisfy Axiom 5'.

Do they satisfy Axiom 4?

Do they satisfy Axiom 5?

## 3 Jehle & Reny 1.13

A consumer has lexicographic preferences over $xR2$ if the relation satisfies $x_1, x_2$ whenever $x_1^1 > x_1^2$, or $x_1^1 = x_1^2$ and $x_1^1 \geq x_1^2$.

(a) Sketch an indifference map for these preferences.

(b) Can these preferences be represented by a continuous utility function? Why or why not?

## 4 Jehle & Reny 1.15

Prove that the budget set, $B$, is a **compact, convex set whenever** $p \gg 0$.

## 5 Jehle & Reny 1.26

A consumer of **two goods** faces **positive prices** and has a **positive income**. His utility function is

$$u(x_1, x_2) = x_1$$

Derive the Marshallian demand functions.

## 6 Jehle & Reny 1.27

A consumer of **two goods** faces **positive** prices and has a **positive income**. His utility function is

$$u(x_1, x_2) = max[ax_1, ax_2] + min[x_1, x_2], \quad where\, 0 < a < 1.$$

Derive the Marshallian demand functions.