

TD – Wednesday, September 27, 2023

Consumer Theory

The following exercises should be submitted on Wednesday, September 27. A particular attention will be given to your presentation.

$L = 2$  is the number of commodities and  $\mathbb{R}_+^2$  is the consumption set of the consumer.

**Exercise 1 (Lexicographic preferences).** For all  $x = (x_1, x_2) \in \mathbb{R}_+^2$  and  $\bar{x} = (\bar{x}_1, \bar{x}_2) \in \mathbb{R}_+^2$ ,

$$x \succ \bar{x} \iff "x_1 > \bar{x}_1" \text{ or } "x_1 = \bar{x}_1 \text{ and } x_2 \geq \bar{x}_2"$$

1. For every  $\bar{x} \in \mathbb{R}_+^2$ , determine and draw the upper contour set  $U(\bar{x})$ .
2. Show that for every  $\bar{x} \in \mathbb{R}_+^2$ , the indifference set  $I(\bar{x})$  is a singleton.

**Exercise 2 (Linear preferences).** For all  $x = (x_1, x_2) \in \mathbb{R}_+^2$  and  $\bar{x} = (\bar{x}_1, \bar{x}_2) \in \mathbb{R}_+^2$ ,

$$x \succ \bar{x} \iff ax_1 + bx_2 \geq a\bar{x}_1 + b\bar{x}_2$$

with  $a > 0$  and  $b > 0$ . For every  $\bar{x} \in \mathbb{R}_+^2$ , determine and draw the indifference curve  $I(\bar{x})$  and the upper contour set  $U(\bar{x})$ .

**Exercise 3 (Leontief preferences).** For all  $x = (x_1, x_2) \in \mathbb{R}_+^2$  and  $\bar{x} = (\bar{x}_1, \bar{x}_2) \in \mathbb{R}_+^2$ ,

$$x \succ \bar{x} \iff \min\{x_1, x_2\} \geq \min\{\bar{x}_1, \bar{x}_2\}$$

For every  $\bar{x} \in \mathbb{R}_+^2$ , determine and draw the indifference curve  $I(\bar{x})$  and the upper contour set  $U(\bar{x})$ .