Microeconomics 1 – Part A: Individual decision making
Masters M1 IMMAEF & MAEF

TD – Wednesday, October 25, 2023

Producer Theory

The following exercises should be submitted on Wednesday, October 25.

In both Exercises 1 and 2, the **basic properties (BP)** of Y to be verified are the following ones.

(BP): Possibility of inaction, closedness, impossibility of free production ("no free lunch"), free-disposal, convexity, increasing/decreasing/constant returns to scale.

Exercise 1. A firm produces commodity 2 using commodity 1 as an input. The production function is:
$$f(z) = \alpha z \text{ with } \alpha > 0 \text{ and } z \geq 0.$$

1. Determine, both formally and graphically, the production set Y associated with the production function f.

2. Determine if the production Y verifies the basic properties **(BP)**.

3. Now answer questions 1) and 2) for the production function : $f(z) = \alpha\sqrt{z}$ with $\alpha > 0$ and $z \geq 0$.

Exercise 2. $L = 3$ is the number of commodities. The firm produces commodity 3 using commodities 1 and 2 as inputs. The production function is

$$f(z_1, z_2) = (z_1)^{\alpha}(z_2)^{\beta} \text{ with } \alpha > 0,\ \beta > 0,\ z_1 \geq 0 \text{ and } z_2 \geq 0$$

1. Write the production set Y associated with the production function f.

2. Determine if the production Y verifies the basic properties **(BP)**.