

Recitation #5 (Friday September 20th)

1. [**Constant returns to scale**] Consider a firm whose production function $f(z)$ exhibits constant returns to scale. Show that its cost function can be expressed as $c(w, q) = q \cdot c(w, 1)$, i.e., the cost per unit times the number of units produced.
2. [**Increasing average product**]. Show that, if a production function $f : \mathbb{R}^{L-1} \rightarrow \mathbb{R}$ satisfies increasing returns to scale, that is,

$$\text{for every } z \in \mathbb{R}^{L-1} \text{ and for every } t \geq 1, f(tz) \geq t f(z)$$

then $f(z)$ also satisfies *increasing average product* property

3. Show that for a single-output technology, Y is convex if and only if the production function $f(z)$ is concave.