

## Additional Exercises for Chapter 4

### Part 1. Cost fcts.

- 1.1 Derive the cost function for a Cobb-Douglas technology.
- 1.2 Derive the cost function for a CES technology
- 1.3 Derive the cost function for a Leontieff technology
- 1.4 Derive the cost function for a linear technology

Hint: Look at the examples in Varian

### Part 2. Cost minimization.

The technology of another firm can be represented by the production function  $f : \mathbb{R}_+^2 \rightarrow \mathbb{R}$ ,

$$f(x_1, x_2) = (2\sqrt{x_1} + 3\sqrt{x_2})^{3/2}.$$

- 2.1 (2pt.) If you can, please name this type of technology.
- 2.2 (4pt.) Formally state the firm's cost minimization problem with all appropriate constraints in their appropriate form.
- 2.3 (12pt.) Please find the firm's two component conditional factor demand functions. These need to be explicitly written as functions. You need to be clear about how you deal with any inequality constraints.
- 2.4 (6pt.) Provide the cost function for this firm clearly stated as a function.
- 2.5 (8pt.) Suppose that this firm's supply function is  $y(p, w_1, w_2) = \left( \frac{3p(9w_1 + 4w_2)}{4w_1w_2} \right)^3$ . Provide the (regular) factor demand function for input one and the firm's profit function, both clearly stated as functions.