

## Microeconomics II

### Homework 3

#### Question 1.

The demand curve of a monopolist is  $Q=2000-100P$ . The marginal cost of a unit of the product is constant and equal 4. In addition, the monopolist has to pay a fixed cost of 1000.

- a. Write the revenue function.
- b. Write the total cost function.
- c. Find the profit-maximizing level of the output, and the corresponding profit.

#### Question 2.

The inverse demand function of a monopolist is  $p(y) = 100 - y$ , and total costs is  $C(y) = y^2 + 10$ .

- a. Find the profit-maximizing level of production and the maximum profit.
- b. Find the price-elasticity of the demand at the profit-maximizing quantity.

#### Question 3.

The inverse demand function of a monopolist is  $p(y) = 12 - y$ , and total costs is  $C(y) = y^2 - 20y + 10$ .

- a. What is the profit-maximizing level of production?
- b. Suppose the government decides to tax the monopolist so that for each unit the monopolist sells it has to pay a tax of \$2. What is the optimal output under this tax?
- c. Suppose the government now imposes a tax of 10% on the monopolist's profits. What is the optimal output under this tax?