1 Regulators (20 points)

Good $y$ is produced by a monopolist. Market demand for $y$ is $p(y) = 20 - \frac{1}{2}y$, and the cost to produce $y$ units is $c(y) = 40 + 4y$.

a) Find the firm’s optimal choice of output, the associated price, and its level of profit.

The government regulator observes that there is a monopoly in the market for this good and suspects that ‘too little’ is being produced.

b) Show that it is socially efficient that the next unit of the good be produced. Find the socially efficient level of output and the associated price.

c) Show that if the regulator enforces the price you found in b), then without barriers to exit the firm would prefer to shut down.

2 Monopoly (20 points)

Give answers to the following questions in two or three non-technical sentences.

a) What makes a ‘natural monopoly’? Give an example.

b) A patent grants temporary monopoly power to its holder. Why might we choose this policy, and what tradeoffs are involved?

3 Two part tariff (20 points)

A monopolist produces $y$ at cost $c(y) = 6y$. The inverse demand function for a single representative consumer is $p = 12 - y$, which is known to the firm. Assume first that the monopolist must set a uniform price $p$ for this consumer.

a) Find the monopolist’s optimal choice of price and output, and the associated amount of profit.

Now assume that the monopolist can set a two-part tariff that charges a lump-sum payment followed by a price per unit.

b) By sketching the marginal cost and demand curves, find the profit-maximizing two-part tariff that the monopolist would charge to this representative consumer. How much profit does the monopolist make in this case?

4 Third degree price discrimination (20 points)

A monopolist produces good $y$ at a cost $c(y) = 10y$, so that marginal cost is a constant $10$ per unit. Two distinct groups of consumers, $A$ and $B$, have demands for $y$ as follows:

$$y_A(p_A) = 120 - p_A \quad (1)$$
$$y_B(p_B) = 200 - p_B \quad (2)$$

First assume that the firm can practice third-degree price discrimination and so can set a different price for each group, $p_A$ and $p_B$. 
a) Find the firm’s optimal choice of $y_A$ and $y_B$, and the associated prices for each group, $p_A$ and $p_B$.

Now assume that the firm is not able to practice price discrimination and must set one price $p$ for the whole market.

b) Write the demand curve for the market as a whole, by adding $y_A$ and $y_B$ under the condition that $p_A = p_B = p$.

c) Find the firm’s optimal choice of $y$, and the associated price $p$. Does the firm do better or worse than in a)?

5 Self-selection (20 points)

Explain in a few non-technical sentences the self-selection problem for a monopolist that wants to practice price discrimination. How can the monopolist get around this problem?