# Theory of the Firm, Fall 2016

## Problem Set 3

Rules: (1) Submission deadline is **October 10th at 9:00** in class or by e-mail (only typed solutions by e-mail). (2) Feel free to consult with your colleagues and any materials, but submit your own solutions. Have fun!

**Problem 3.1**
Think of your favorite ice cream place and imagine that it would become a monopoly. Discuss shortly whether and how (or why not) the owners could use:

1) first-degree price discrimination,

2) second-degree price discrimination,

3) third-degree price discrimination.

In each case, be specific what they could do and how this would increase profits (and what would be the potential downsides), but your answer to each question should not be longer than 2–4 sentences.

**Problem 3.2**
Exercise 3.3* (page 145)[1].

**Problem 3.3**
Exercise 3.5** (page 148)

**Problem 3.4**
Monopolist, who produces at constant marginal cost $c = 1$, knows that its consumers get utility $\theta V(q) - T$ when they consume $q$ units and pay $T$, and 0 when they choose to buy nothing, where $V(q) = q - \frac{q^2}{2}$ and $q \in [0, 1]$. Moreover, monopolist also knows that there are two types of consumers, half of the consumers have value $\theta = 2$ and half value $\theta = 3$.

1) State the maximization problem and constraints. Derive the profit-maximizing menu $(q_1, T_1)$, $(q_2, T_2)$ and the corresponding profit level.

2) Suppose now that the monopolist observes the types of consumers. State the maximization problem and constraints. Find the profit-maximizing menu and the corresponding profit level.

3) Consider social planner, who observes the consumer types. What would be the menu that it offers? (Give at least one, if there are multiple options.)

4) Consider social planner, who does not observe consumer types. What would be the menu that it offers now? (Again, at least one.)

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[1]All references are to Tirole's book "The Theory of Industrial Organization".