

# ECON 7050

## HW on Contract Theory

due Dec 3

**Problem 1** Consider the monopolist problem studied in class. Assume utility of the buyer is  $u_\theta(x, t) = \theta\sqrt{x} - t$ , and the marginal cost is constant at  $c$ .

Assume the monopolist can observe the type of the customer ( $\theta$ ) and can successfully discriminate across consumers. What bundle  $(q, t)$  will the monopolist offer to each customer? What are the profits of the monopolist?

Assume the type is not observable and the monopolist believes that  $\theta$  is distributed uniformly on  $[a, b]$ ,  $a > b > 0$ . What is the optimal menu of contracts that the monopolist will offer in this case?

**Problem 2** Formulate and prove the revelation principle.

**Problem 3** Section 7.2.2 of the textbook. Suppose buyer's value and seller's cost are distributed uniformly on  $[1, 50]$  and  $[0, 2]$  correspondingly. Calculate the highest level of joint welfare,  $U_1(2) + U_2(1)$ , that allows the benevolent mediator to implement efficient trading.