

EconS 503 - Microeconomic Theory II
Homework #2 - Due date: Wednesday, February 5th, in class.

1. **Exercises from Tadelis:**

- (a) Chapter 4, exercises 5 and 7.
- (b) Chapter 5, exercises 1, 7 and 11.

2. Consider the 3x3 matrix at the bottom of page 72 in Tadelis.

- (a) Find the strict dominant equilibrium of this game.
- (b) Which strategy profile/s survive IDSDS?
- (c) Which strategy profile/s survive rationalizability?

3. **Cournot game.** Consider a Cournot duopoly game with two firms facing an inverse demand function $p(Q) = a - bQ$, where $Q = q_1 + q_2$ denotes aggregate output. Every firm i 's cost function is denoted by $c_i(q_i)$. For generality, we do not assume any properties on this cost function.

- (a) Set up firm i 's profit-maximization problem and differentiate with respect to output q_i to find firm i 's first-order condition. Check that the second-order and boundary conditions of this first-order condition are satisfied.
- (b) Now suppose that there are $N \geq 2$ identical firms, which all have cost function $c_i(q_i) = cq_i$, where $c > 0$. Find the Nash equilibrium as a function of N , and describe its limit when $N \rightarrow +\infty$.