

SECOND MIDTERM EXAM Economics 401 Spring 2008, David K. Levine

Do all three questions, each has equal weight. You have 1 hour and 23 minutes.

1. How to sell a house?

You wish to sell a house that is worth \$100,000 to you. There are two potential buyers, who value the house at \$350,000 and \$450,000 respectively. You may sell the house in a second price sealed bid auction in which the only possible bids are \$340,000 and \$440,000. Alternatively, you may sell the house by setting a take-or-leave-it price of either \$340,000 and \$440,000. In both cases the high value buyer moves first, and the low value buyer moves second after seeing the move of the high value buyer. In case of a tie, a coin is flipped to see who gets the house. Both buyers are risk neutral. Notice that this is a *three player* game.

- Find the extensive form of this game.
- Find the normal form of the subgame in which the auction takes place.
- Find *all* Nash equilibria of the subgame in which the auction takes place
- Find the subgame perfect equilibrium of the entire game.

2. A PD of Sorts

Consider the following symmetric game in which you can either pat, tap or rat your opponent. Suppose that it is infinitely repeated with discount factor $0 \leq \delta < 1$.

	pat	tap	rat
pat	6,6	0,5	4,7
tap	5,0	0,0	0,0
rat	7,4	0,0	5,5

- Give an accurate sketch of the socially feasible individually rational set.
- What does the Folk Theorem say about this set?
- Find grim trigger strategies so that players both get 6 in equilibrium.
- For what discount factors are the grim trigger strategies in part c) a Nash equilibrium?
- If the grim trigger strategies are a Nash equilibrium, why are they also subgame perfect?

3. Long Run versus Short Run

A telephone salesperson (player 2) must decide whether to phone a hard-working blue collar worker (player 1). If there is no phone call, both get 0. If salesperson calls, the worker must decide whether to buy the produce, giving the salesperson a payoff of 1 at a cost to the worker of 1 (that is, player 1 gets -1 in this case), or whether suffer an endless sales call. The endless sales call yields a payoff of -2 to both players.

- Find the extensive and normal form of this game.
- What pure strategy Nash equilibria are there in the stage game; which are subgame perfect? What is the Stackelberg equilibrium of the stage game in which 1 moves first?
- If the stage game is repeated and player 1 is infinitely lived with discount factor equal to δ and there is a sequence of short-lived sales people propose a equilibrium strategy and a δ such that players end up playing Stackelberg every period.