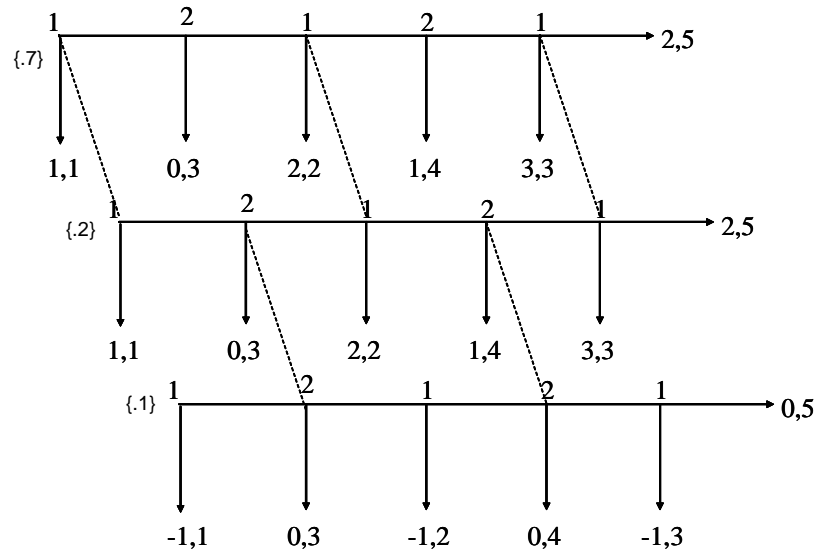


14.123 Microeconomic Theory III
Problem Set 4

1. Find a sequential equilibrium of the following game, in which Player 1 does not know whether Player 2 knows that Player 1 is rational. (The initial probability of each branch is indicated at the beginning of the branch. Verify that the assessment you find is indeed a sequential equilibrium.)



2. There are 100 days, $t = 0, 1, \dots, 99$. There are a monopolist and a sequence of customers, one for each day t . On each day t , the monopolist chooses a quality level $q_t \in [0, 1]$ and the customer of the day chooses whether to buy at a fixed price $p \in (0, 1)$, without knowing the quality. Write $b_t = 1$ if the customer of day t buys and $b_t = 0$ otherwise. The payoff of customer at t is $(q_t - p)b_t$. The monopolist has two types. With probability $1 - \pi \in (0, 1)$ he is of *rational* type with payoff

$$\sum_{t=0}^{99} (pb_t - cq_t)$$

where $c \in (0, p)$. With probability π , he is of *pious* type with payoff

$$\sum_{t=0}^{99} q_t.$$

All the previous quality levels are publicly observable.

- (a) Compute the sequential equilibrium. (It is unique.)
 (b) Assuming $c \cong 0$, compute the ex-ante optimal p for the monopolist, given the equilibrium strategies. (You can approximate the functions if needed.)

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