

Algorithmic Game Theory

Summer 2015

Exercise Set 5

Exercise 1: (6 Points)

Compare and contrast an eBay auction with the sealed-bid second-price auction described in class. (Read up on eBay auction bidding rules if you don't already know how they work.) Should you bid differently in the two auctions?

Exercise 2: (4 Points)

Consider a single-item auction with at least three bidders. Consider the following "third-price auction": awarding the item to the highest bidder, at a price equal to the third-highest bid. Prove that this auction is not incentive compatible.

Exercise 3: (5 Points)

Suppose there are k identical copies of a good and $n > k$ bidders. Suppose also that each bidder can receive at most one good. What is the analog of the second-price auction? Prove that your auction is incentive compatible without using the IC characterization theorem discussed in class.

Exercise 4: (5 Points)

We concluded the proof of Myerson's Lemma by giving a "proof by picture" that coupling a monotone allocation rule with the specific payment formula yields an incentive compatible mechanism. Describe a scenario where this proof-by-picture breaks down if the allocation rule is not monotone.