Exercise session #12

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Problem 1

Suppose that there are N risk-neutral bidders. Derive $b^*(v)$. Show how the bidding behavior changes when the number of bidders increases.

Problem 2

In the first-price sealed bid auction with two risk-neutral bidders find the revenue of the seller. Depict the bidder's expected payment and bidder's expected profit in graph with $(v, F(v))$ locus.

Problem 3

Introduce the second-price sealed bid auction. Show that bidders bid their true value, $b^{sp}(v) = v$. Compare $b^{sp}(v)$ to $b^*(v)$.

Problem 4

In the auction the seller seeks to maximize the expected revenue.

a. Show that the variability of the price is higher in the SP auction.

b. Show the equivalence of *ex ante* expected revenue in the first and second price sealed bid auctions. Is the *ex post* revenue in general the same?

c. Consider the expected revenue from alternative auction setups: English and Dutch auctions.

Problem 5

Within our theoretical framework discuss the auctioning of ads by Google and Yahoo.

Problem 6

Suppose the seller has a reserve price $r > 0$, that is, she agrees to sell the object to the bidder with the highest bid as long as $b(v) \geq r$.

1. Intuitively, what implications will it have for the bidding behavior and the seller's revenue?

2. Re-derive $b(v)$ and the seller's revenue.

Suppose that instead of the reserve price r, there is an entry fee imposed on each bidder. Will it have the same effect on the number of bidders and their bidding behavior?

Problem 7

Suppose that the highest bidder wins the auction and pays a convex combination of his own bid and the second highest bid. Find the bidding strategy.

Problem 8

Consider the possibility of a re-sale after the auction by the highest bidder, who makes a take-it-or-leave-it offer to the bidder with the lowest bid (only two bidders are in the game). Find the bidding strategy.