QUIZ 3, ECON375 (WHITE) April 29, 2003

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All questions must be answered on this test form!
For each question you must show your work and (or) provide a clear argument.

Question 1 Two bidders, A, and B, have independent private values for an object which is sold in a simultaneous bid, first price auction. That is, A's and B's valuations V_A and V_B are stochastically independent, and uniformly distributed on $[0, 1]$. If A's bid is b_A and B's bid is b_B then A wins if $b_A > b_B$ and A must pay b_A. If $b_B > b_A$ then B wins and pays b_B. If there is a tie then each person gets the object with probability 0.5. Assume that person B uses the strategy $b_B(V_B) = V_B^3$. Then A's best response is given by the strategy

$$\boxed{\boldsymbol{b_A(V_A) =} \qquad\qquad\qquad\qquad}$$

3 points

Question 2 Assume an object has a value of \$100. This value is known to the two bidders. In the auction both agents make bids simultaneously. Let b_i and b_j denote the two bids. Then if $b_i > b_j$, person i receives the object and pays $3/4$ of his/her bid. The loser, person j, pays $1/4$ of his/her paid. In this game, only mixed strategy equilibria exist. Find a mixed strategy equilibrium, where each agent's bid is described by a c.d.f, $F(b)$ with $F(0) = 0$.
(Recall that $F(b)$ is the probability that the person makes a bid less or equal to b.)

$\boldsymbol{F(b) =}$

3 points

Question 3 Assume the value of an object is given by $v = \alpha\beta$, where α and β are stochastically independent, and uniformly distributed on $[0, 1]$. Person A knows the value of α (but not β), while B knows β (but not α). The object is sold in a Vickrey auction, i.e., both parties submit bids and the winner pays the second highest bid. Assume that A observes a value $\alpha = 1/3$. Assume that both A and B bid the expected value of the object given their observed value of α and β, respectively. Then

A' expected payoff is

3 points

(*This number could be negative, if A loses money using the above strategy*)