

Passed Solution Review

4. Suppose that a person (the “seller”) wishes to sell a single desk. Ten people are interested in buying the desk: Ann, Bill, Colin, Dave, Ellen, Frank, Gale, Hal, Irwin, and Jim. Each of the potential buyers would derive some utility from owning the desk, and this utility is measured in dollar terms by the buyer’s “value.” The valuations of the 10 potential buyers are shown in the following table.

Ann	Bill	Colin	Dave	Ellen	Frank	Gale	Hal	Irwin	Jim
45	53	92	61	26	78	82	70	65	56

Each bidder knows his or her own valuation of owning the desk. Using the appropriate concepts of rationality, answer these questions:

- (a) If the seller holds a second-price, sealed-bid auction, who will win the auction and how much will this person pay?

Colin wins and Pays \$82

- (b) Suppose that the bidders’ valuations are common knowledge among them. That is, it is common knowledge that each bidder knows the valuations of all of the other bidders. Suppose that the seller does not observe the bidders’ valuations directly and knows only that they are all between 0 and 100. If the seller holds a first-price, sealed-bid auction, who will win the desk and how much will he or she have to pay? (Think about the Nash equilibrium in the bidding game. The analysis of this game is a bit different from the [more complicated] analysis of the first-price auction in this chapter because here the bidders know one another’s valuations.)

Colin wins and Pays \$82 + c where c is the smallest denomination available

- (c) Now suppose that the seller knows that the buyers’ valuations are 45, 53, 92, 61, 26, 78, 82, 70, 65, and 56, but the seller does not know exactly which buyer has which valuation. The buyers know their own valuations but not one another’s valuations. Suppose that the seller runs the following auction: She first announces a *reserve price* \underline{p} . Then simultaneously and independently the players select their bids; if a player bids below \underline{p} , then this player is disqualified from the auction and therefore cannot win. The highest bidder wins the desk and has to pay the amount of his or her bid. This is called a “sealed-bid, first price auction with a reserve price.” What is the optimal reserve price \underline{p} for the seller to announce? Who will win the auction? And what will the winning bid be?

If the seller knows how much people are willing to pay, they should set \underline{p} = maximum WTP. Thus, Colin wins and Pays \$92