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Econ 280—Bethany College

**Homework 05**

Answer all the following on a ***typed, stapled*** (if applicable)separate sheet of paper. You do not need to type equations and graphs. I charge 25 cents to staple your homework. Make sure that you justify your answers, use your own words, and show your work. All questions are equally weighted.

1. Recall that an English auction and a 2nd price sealed bid auction have the same strategy. Why do these auctions have the same strategy (it is helpful to explain how one auction can easily be transformed into the other)? In other words, why are these auctions basically the same auction?

*English and 2nd price sealed bid are basically the same because in both cases, the bidder with the highest value wins but only pays the price of the next highest bidder. While this is obvious for a 2nd price sealed bid auction (that’s the process by definition), it is also true for the English auction: the price grows by increments as bidders out-bid each other until no one by one bidder is willing to go higher. This boundary is the next highest bid.*

*We can also see it as how easily an English auction turns into a 2nd price sealed bid auction. If all participants left and submitted their maximum bid to the auctioneer, the auctioneer could easily determine not just who won the auction (the highest value bidder), but how much will they pay (the value of the next highest bidder). As described above, it becomes a 2nd price sealed bid auction.*

1. Provide an example when someone might suffer from the winner’s curse. Do not use the jar of coins or bidding on oil field examples we used in class. Remember to justify your example.

*Imagine the more money you invest in R&D, the more likely you are to accomplish an invention (a reasonable assumption). It is common for many firms to be attempting to invent the same thing, trying to out-race each other to secure a patent. But we can never really know what the commercial value of the item will be once it’s invented. Some will over-estimate and some will under-estimate. Those that over-estimate will invest the most in R&D and win the patent, a patent which will not be worth the investment they made to get it.*

*It’s worth noting that this “auction” is not the typical auction we’ve discussed. Specifically, it is called the all-pay auction. You pay your bid regardless if you win the auction or not. (In this case, the bid is the R&D investment.) But the basic idea still holds, especially if the resulting patent has no commercial value (and many do not).*

1. Why does the Revenue Equivalence Theorem require risk neutrality? (One way to answer this question is to explain the intuition behind why revenue for different auctions changes when you remove this requirement.)

*In both the Dutch and 1st price sealed bid auction, there is an incentive to shave your bid away from its true value. Such shaving is risky, however. The more you shave, the more consumer surplus you can get but the greater likelihood someone will outbid you. If people are risk loving, you will shave a lot so such auctions will not produce as much revenue as the English or 2nd price sealed bid auctions. If people are risk averse, then they will shave little and the Dutch and 1st price sealed bid actions will make more revenue. Risk neutrality puts us right in the middle where they are equal. (The fact that risk neutrality makes both types of auctions equal is a result of the mathematical proof for this theorem. If you want to know more, please see me during office hours.)*

1. In *A Beautiful Mind*, the story of John Nash, Nash is at a bar with several male friends. There are several brunette women and one blonde. All men prefer the blonde. Nash Equilibrium is described as:

If we all go for the blonde and block each other, not a single one of us is going to get her. So then we go for her friends, but they will all give us the cold shoulder because no one likes to be second choice. But what if none of us goes for the blonde? We won't get in each other's way and we won't insult the other girls. It's the only way to win.

This is quite possibly the worst description of Nash Equilibrium ever written. Why is this not Nash Equilibrium?

*This is not Nash Equilibrium because at least one player (i.e. the men) will want to change their strategy, holding the strategy of the others constant. By definition, Nash Equilibrium is when* ***no*** *player wishes to change strategy holding the strategy of other players constant.*

1. Below is a game called Battle of the Sexes (or, more generally, Battle of Two Cultures). Andrew and Betty want to go see a movie. Betty prefers action and Andrew prefers comedy. But as much as they like their respective genres, they’d much rather be with one another. Find Nash Equilibrium. Justify your answer.

|  |  |
| --- | --- |
|  | Betty |
| See Comedy | See Action |
| Andrew | See Comedy | 3 , 2 | 1 , 1 |
| See Action | -1 , -1 | 2 , 3 |

*Here, there are two Nash Equilibria: Both see comedy and both see action. In each of those cells, neither Andrew nor Betty would like to change their respective strategy holding the other’s strategy constant. They would rather be with each other doing something they don’t like rather than being apart and doing something they do like. And people say economics isn’t romantic.*