Mock Midterm
Games, Competition and Markets
2024/2025

Notes in advance:

1. Always motivate your answer.
2. You can refer to the lecture notes or tutorial solutions, but you have to do so clearly (point clearly to the exact result, with page number and equation), unambiguously, and convincingly.
3. If you cannot find the exact answer, at least try to give a partial answer – or at least some steps that have to be taken to obtain the final answer.
4. Good luck!

Problems.

1. Consider the Hotelling model as discussed in the notes. However, firm 0 sells a product that is somewhat better than that of firm 1. More precisely, consumers have a willingness-to-pay v_0 for the product of firm 0 and v_1 for the product of firm 1, with $v_0 > v_1$. Of course, they will also take transport costs and prices into account when making their decision. Again we assume that the v's are high enough such that all consumers buy in equilibrium and, moreover, that both firms have strictly positive sales in equilibrium. Derive equilibrium prices and profits (Note: firms are no longer symmetric).
2. Solve the Anderson-Renault model with 2 firms and a uniform distribution of match values for the case that $v = 0$. Write equilibrium prices in terms of search costs s.

3. Consider the Grossman/Shapiro model as described in the lecture notes, but with $t = 1$ and $c = 0$. However, different from the model in the notes, we assume the following about the fraction of consumers that is informed by each firm;

   - Consumers that do not receive any ad do not learn about the existence of the product and hence do not buy (this is the same as in the standard model).
   - Consumers that receive ads from both firms buy the product that is best for them (again, same as in the standard model)
   - Half of all consumers that only receive an ad from firm 1 only learn about firm 1 and hence will buy there (again, same as standard model).
   - But the other half of all consumers that only receive an ad from firm 1 are going to actively seek out whether other firms also sell this product and hence also become informed about firm 2.
   - The same holds for consumers that only receive an ad from firm 2: half of them only learn about firm 2 but the other half learn about firm 1 as well.

   Derive the reaction function for the price of firm 1 in terms of the price of firm 2 and the advertising levels Φ_1 and Φ_2.

4. There are two types of consumers. Each consumer has a willingness to pay $\theta q - q^2$ for a bundle consisting of q units of some good. A fraction λ of consumers has $\theta = 75$, the remaining $1 - \lambda$ have $\theta = 80$. Marginal cost of production are constant and equal to 25. A monopolist cannot observe the type of an individual consumer. It engages in menu pricing and designs packages (q_{75}, T_{75}) and (q_{80}, T_{80}) in a profit-maximizing manner such that both types of consumers choose the package that was designed for them. Here, q_θ is the number of units designed for a type $\theta \in \{75, 80\}$, and T_θ the total amount that has to be paid for such a package.