Brief Solution Guideline for Product Differentiation Problems

1. In models of monopolistic competition, entry of comparable goods makes each competitor's residual demand curve retreat until it is just tangent to the average cost curve. Students are told that each competitor then prices at average cost, for a profit of zero. Students often ask why firms are not producing a quantity (and setting a price) according to the usual condition, that marginal cost equals marginal revenue. Using a linear demand curve, prove that there is no contradiction between the two positions.

Try assuming some numbers, e.g. F = 100, MC = 2. Then, draw the situation where demand just tangents to the average cost (AC) curve. After that, try doing the profit-maximization technique (set MC = MR) on the same graph. You should get the same optimal price and quantity under both situations.

2. On an atoll in the Pacific island group Saloponesia there is just one street, Ring Street, along which all people live—one islander per unit distance—and along which all shops are located. The island group used to be a French colony, which may explain the islanders' custom of walking to a nearby bakery every day to buy a fresh chocolate croissant. Their attachment to this custom is not unbounded, however. Depending upon the opportunity cost of their time spent walking; they may find croissants too expensive. In that case they stay home and eat corn flakes instead. Each of the bakers runs exactly one bakery and, when not baking, plays Bertrand. Set up a model (adopting simplifying assumptions where appropriate) to analyze this croissant market, and describe the equilibrium if it is given that there are some islanders who eat corn flakes.

Try applying the Salop circle model to describe this situation.

3. The inverse market demand curve for a certain commodity is $p = 85 - 10Q$, and costs to a single firm of producing it are $C(q) = 120 + 25q$. Show that it is socially desirable that a certain quantity of the commodity is produced, but that no firm is willing to provide it. How might the government insure that the socially optimal level of output is provided?

The product may not be provided since the fixed cost is too high (F = 120). If you try drawing the demand curve and AC curve, demand curve will be UNDER the AC curve. Here, no firm finds it profitable to operate.

In any case, if we take the fixed cost out of question and consider the total welfare under the socially optimal output level (where MC = marginal willingness to pay (or the demand curve)), we can see that once the product is produced, total welfare would become 170. This is greater than the fixed cost of 120.

To achieve the socially optimal the government could ask a firm to produce. Then, pay for the fixed cost and ask the firm to charge P = MC.
**** See the companion power point for detailed calculation**

4. If Hotelling's Main Street were circular, but all else remained the same in the model as described in class and in the textbook (including the assumption that the government sets the price), where would the two stores locate?

It does no matter where each store locates. Each will get 50% market share anyway.

5. Why might the representative consumer model not accurately describe a monopolistic competitive equilibrium for an automobile market that includes Honda, Toyota, Audi and Ferrari models?

Consumers have different tastes. So, we cannot assume that one consumer can be a representative of others.