ECON 321, Professor Hogendorn, Spring 2013

Midterm Exam

Each part of each question (a, b, c, etc.) is worth 5 points. Make sure to allot your time accordingly. Total of 30 points, -1 for messiness, -2 for extreme messiness.

1. What is the difference between an address model and a non-address model of product differentiation? Is differentiated Bertrand an address model or a non-address model? If you were going to model consumers choosing an Android versus iOS smartphone, which type of model would you choose? Why? (Either choice is fine, but justify.)

2. In stage 1, Firm A can choose two technologies: one with MC=10 and one with MC=40. In stage 2, Firm A and Firm B compete à la Cournot and Firm B always has a marginal cost of 30. Draw the reaction function diagram of the two firms, showing the Cournot equilibrium points in both cases.

3. *Contestability.* There is a market with inverse demand $p(Q) = 100 - Q$. The only available technology to serve this market has total variable costs $TVC(q) = q^2$. Firm 1 already owns this technology and does not have to pay any fixed costs.

   There is a potential entrant Firm 2 that could enter the market by paying a fixed cost of 2300. Of this amount, $Z\%$ is sunk, so if Firm 2 later decides to leave the market it can recover $2300(1 - Z)$.

   Demand is undifferentiated Bertrand, but prices must be set in multiples of \$5. Thus if Firm 1 charges \$75 and Firm 2 charges

$70, Firm 2 gets the entire market. As you'll see below, in this question only one firm ever serves the market.

(a) Write down the monopoly profit maximization problem and verify that the monopoly profit-maximizing price is 75.

(b) Graph the monopoly diagram, labeling the quantity, price, monopoly operating profit, consumer surplus, and deadweight loss. Is there any reason to think that the social cost of the monopoly might exceed the deadweight loss?

(c) Suppose Firm 1 and Firm 2 play the following game over 3 years, receiving the relevant payoffs in each year. In year 1, Firm 1 sets $p = 75$ and receives the monopoly payoff. In year 2, Firm 2 can not enter or it can enter and set $p = 70$. In year 3, Firm 1 can keep its price at $p = 75$ (and the entrant thus serves the whole market at price of 70) or Firm 1 can lower its price to $p = 65$ and the entrant exits the market. Write down the game tree and the payoffs of this game. (Keep it simple, do not use discounting even though there are 3 years. And by the way, the operating profits are 1250 at price of 75, 1200 at price of 70, and 1050 at price of 65.)

(d) How low does the sunkenness percentage Z need to be in order to have this market be contestable (i.e. to convince the entrant to enter)?

4. Does Professor Hogendorn drink martinis made with vodka or gin? (Sorry, no points for this question.)