Problem Set 3

Econ 1: Problem Set 3--due Feb 24/25

Several hundred miles north of the metropolis of Esseph in the state of Euphoria is the city of Chief Joseph, home of the Miniflexible company, monopoly provider of operating systems to desktop personal computers. Variable costs for Miniflexible are zero: operating systems are distributed for free over the internet. The annual amortized costs of writing and maintaining the operating system are:

FC = $3,000,000,000

1) Suppose that annual demand for desktop personal computers is given by:

P = $200 - 0.000001Q

That is: Miniflexible has to cut the price by $1 in order to sell an extra one million operating systems a year. The demand curve thus has a y-intercept of $200 (the maximum willingness-to-pay of any potential purchaser) and an x-intercept of 200,000,000/year (the number of potential purchasers who would receive any benefit at all from the commodity—who have a positive willingness-to-pay).

a) What is the profit-maximizing quantity for Miniflexible to sell its customers?

b) What is the profit-maximizing price for Miniflexible to charge its customers?

c) How much consumer surplus do purchasers receive?

d) How much in monopoly profits does Miniflexible make?

2) Suppose that Al Gore had been elected President and had made it a priority for the government to not just fund the creation of the Internet but also to write and distribute the operating system for desktop computers.

a) How much in extra taxes would the government have to raise a year to fund this additional government program—this Computer Operating System Taskforce—if the U.S. government's operations were only 60% as efficient as those of the private profit-seeking sector?

b) How much should the government charge for the operating system?

c) How much consumer surplus will users of the operating system then receive?

d) How would you evaluate, from a societal-welfare point of view, the relative merits of (a) monopoly provision by Miniflexible, and (b) socialism in the form of public provision for free?

3) Suppose that Elizabeth Warren were elected President and made it a priority for the government to regulate monopolies like Miniflexible. She names Berkeley Professor Dan Rubinfeld to run the new Computer Regulatory Analysis Fact-finding Taskforce and to set a price at which Miniflexible can sell its operating system. The mandate of CRAFT is that it must (a) maximize consumer surplus without either (b) making Miniflexible unprofitable or (c) requiring that public tax money be spent.

a) What should Dan Rubinfeld set as the amount Miniflexible should be allowed to charge for its operating system? (HINT: Either write down the equation for revenue as a function of price and quantity and then use the quadratic formula to figure out at what P/Q pair revenue is equal to costs; or simply set up a spreadsheet and do an exhaustive search—start with the price at the maximum willingness to pay and march down the page, with each line calculating revenue and costs for a different price, and see how low you can push the price before Miniflexible starts losing money and can no longer cover its costs. I would do the second myself.)

b) How much consumer surplus will users of the operating system then receive?

c) How would you evaluate, from a societal-welfare point of view, the relative merits of (a) monopoly provision by Miniflexible, (b) socialism in the form of public provision for free, and (c) the regulated monopoly where Miniflexible is allowed to cover its costs?

4) Is there anything else you might want to try if you were in charge of designing market structure for the operating-systems-for-desktops industry? (Briefly: in three or so sentences, and certainly no more than 100 words)

5) Suppose that software piracy is rampant: suppose that 75% of potential purchasers—with no pattern as to their relative willingness-to-pay—pirate the software and download it for free. How would this change your analysis? (Briefly: in three or so sentences, and certainly no more than 100 words)

6) Suppose that software piracy is less rampant: that 50% of potential purchasers—with no pattern as to their relative willingness-to-pay—pirate the software and download it for free. How would this change your analysis? (Briefly: in three or so sentences, and certainly no more than 100 words)

7) Suppose that it is a well-established norm in the software industry that if there is more than one producer in the business, you charge what you would charge if you were the monopolist, and you thus share the market. In the absence of government regulation or socialistic public provision for free, if anyone can make an operating system for an amortized cost of $3B/year, how many producers would you expect to see in the operating-system market? What would your welfare analysis be? (Briefly: in three or so sentences, and certainly no more than 100 words)