

SAMPLE MIDTERM EXAMINATION
(This exam was given Tuesday, October 24, 2000)

Directions: This is a closed-book exam. Please print your name clearly on each answer book.

Answer all questions as clearly and legibly as possible. The exam has a total of 420 points; the number of points and a suggested amount of time is indicated for each question. You must turn in this exam along with your answer books before leaving the room.

Students in the 8:30 a.m. section:

I will not discuss the contents of this exam with anyone in other sections before 1:00 p.m.

Students in the 10:30 a.m. and 11:30 a.m. sections:

I have not discussed the contents of this exam with anyone who took it earlier this morning.

Signed: _____

Print your name: _____

1. (160 points; 28 minutes) Decide whether each of the following statements is **True**, **False**, or **Uncertain**, and give a **brief but clear explanation** of your answer. (Most of the credit will be given for the explanation.)

- 1a) Your company makes a cordless electric drill for the retail market. Drill prices are described by the following hedonic price equation:

$$\ln P = 3.60 + .046 \ln (M) - .893 \ln (W) + .928 \ln (L) + e ,$$

where P is price in dollars, M is the drill's maximum speed, W is weight in pounds and L is average life in years. "Ln" indicates a natural logarithm. Your drill currently sells for a price of \$ 59.95, with a maximum speed of 4000 revolutions per minute, a weight of 10 pounds and an average lifetime of 7 years.

You can lower the weight of your drill from 10 pounds to 9 pounds by using lighter materials, at an additional cost of \$ 5 per drill. (The change would not affect drill speed or life). You should recommend making this change.

(Note: you do not need to calculate logarithms to answer this question.)

- 1b) When Boeing recently tried to expand its level of output, production costs per aircraft rose substantially. The reason is that Boeing was experiencing diseconomies of scope.

(The following 2 questions require a newspaper clipping that is not available any more.)

Read the news clipping below regarding the imposition of a Value Added Tax (VAT) for the following:

- 1c) The appropriate market definition for transport on this route from Sweden to Denmark includes the ferry operators.
- 1d) The Oresund consortium was unable to pass the tax increase onto consumers in the form of higher prices because the market demand for transport on this route is inelastic.

Add clipping

2. (60 points; 12 minutes) Many observers regarded the Sony Playstation as the industry standard for dedicated video game consoles from 1996-1999. In 1999, the Sega Dreamcast was introduced as a superior alternative to the Playstation, although there was not a large amount of software developed for it. (Software/games written for one company's game console is incompatible with another company's console.)

In addition, Sony has spent several years and \$500 million developing its new video game console, Playstation II, a machine with substantially more advanced features than Sega's Dreamcast. In fact, during the launch of Sega's Dreamcast, Sony advertised heavily that the Playstation II would be available soon, and as a result, many consumers have delayed purchasing a new game console. Playstation II is widely expected to become the most popular video game console once it is released

Comment on "There is a powerful network externality at work in the video game console market." Be sure to define positive network externality, indicate whether this statement is **true** or **false**, and clearly explain your reason.

3. (100 points; 20 minutes) America's Game, Inc., is a monopoly producer of baseballs. Suppose that the demand for baseballs is given as

$$Q = 40,000 - 20,000 P$$

where P is in dollars per baseball. Baseballs can be produced in a facility in Southeast Asia, with cost function

$$C(Q_1) = (1/20,000) (Q_1)^2.$$

Baseballs can also be produced in a facility in Latin America, with cost function

$$C(Q_2) = (1/40,000) (Q_2)^2.$$

3a) Illustrate graphically the monopolist's problem: optimal total production level and production levels for baseballs in the two production facilities. Is any output produced in the Southeast Asia production facility (given that its cost curve is higher than that for Latin America, at all output levels)? Why or why not?

3b) What is the optimal price of baseballs? How many are produced in Southeast Asia? How many are produced in Latin America? What are total profits to America's Game, Inc.?

(See next page for problem 4)

4. (100 points; 20 minutes) Workers must travel from Judsonville to the Daviston copper mine and return every day. On a monthly basis, demand for bus rides is given by

$$P = 200 - 2Q$$

where P is in cents per ride and Q is in thousands of rides. The marginal cost of each ride is 40 cents (there are no economies of scale and no fixed costs).

4a) Suppose that the transit business is perfectly competitive, and there are no barriers to entry. How many bus rides are sold, what price they are sold at, and what are the values of consumer and producer surplus?

4b) Suppose that an exclusive license is obtained by Trailaway to provide transit between Judsonville and Daviston, so that Trailaway is a monopoly provider of these bus rides. How many bus rides are sold and at what price they are sold? What is Trailaway's profits, and what is the dead weight loss relative to **4a)**?

4c) Suppose that a government subsidy of 20 cents per ride is paid to the Trailaway monopoly. How many bus rides are sold and what price they are sold at? What is Trailaway's profit, what is the cost of the subsidy program, and what is the dead weight loss relative to **4a)**?