

Economics 101
Homework #5
Fall 2009
Due 12/9/2009 before lecture

Directions:

- The homework will be collected in a box before the lecture.
- Place your name, TA name and section number on top of the homework (legibly).
- Late homework will not be accepted.
- It is essential that you do the homework; you can work with others but you must write up the solutions yourself.
- Please show your work.

1. Monopoly

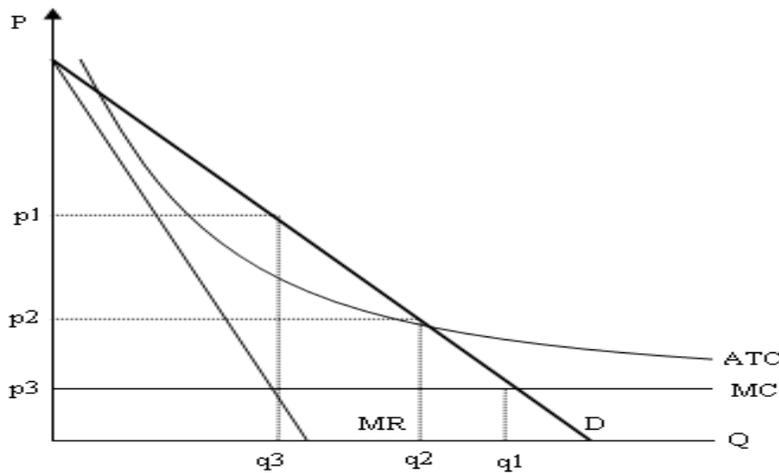
Suppose Harley-Davidson is a Monopolist of motorcycle manufacturing in Wisconsin. The market demand curve faced by Harley-Davidson is $Q = 400 - \frac{1}{3}P$, and the cost of producing motorcycles is comprised of fixed costs of \$100,000 plus an additional \$60 for each motorcycle produced.

- a) What is the equation for Marginal Revenue?
- b) What is the equation for Marginal Cost?
- c) Draw the Demand curve, Marginal Revenue curve, and Marginal Cost curve for this monopolist in a graph.
- d) What is the monopolist's profit-maximizing production quantity (Q_M)?
- e) What price (P_M) will the monopolist charge?
- f) Suppose this market was a perfectly competitive market (i.e., the monopolist's demand curve is still the market demand curve, but now there are many producers providing motorcycles for the market). Given the market is perfectly competitive, what would be the equilibrium price (P_C) in this competitive market?
- g) What is the equilibrium quantity (Q_C) demanded in this market if the market is a perfectly competitive market?

Now, let us compare the monopoly and perfect competition outcomes.

- h) What is the difference between the consumer surplus in the monopoly case and the consumer surplus in the perfect competition case?
- i) What is the difference between the producer surplus in the monopoly case and the producer surplus in the perfect competition case?
- j) What is the monopolist's profit?
- k) What is the dead weight loss caused by the monopolist?

2. Natural Monopoly



Use the above graph to answer this next set of questions.

- What is the natural monopolist's profit maximizing quantity and price?
- Explain why a natural monopoly that acts as a single price monopolist is inefficient in at least two ways.
- What will happen to the monopolist in the long run if the government chooses to regulate its production to the point where price equals marginal cost? Explain your answer.
- What is the break even quantity and price for this monopolist? Should the government regulate the monopolist to produce at this breakeven point? Give a brief argument supporting or refuting this type of regulation.

3. Reservation Price and Price discrimination

- Nathan is the only barber on State Street, and he has customers with the following reservation prices for a haircut:

Customer	Reservation Price
A	\$ 18
B	\$ 20
C	\$ 11
D	\$ 16
E	\$ 13

Suppose it costs Nathan \$8 per haircut, and assume everyone just needs one haircut.

- a) What is the socially efficient number of haircuts? Explain your answer.
- b) What is the profit maximizing number of haircuts for Nathan if Nathan can charge only one price for his hair cuts? Show a step by step procedure for determining the profit maximizing number of hair cuts.

2. Suppose University Book Store is the only place that sells UW T-shirts in Madison. The following table gives the reservation price of the customers interested in buying a UW T-shirt.

Customer	Reservation Price
A	\$100
B	\$90
C	\$75
D	\$60
E	\$50
F	\$40
G	\$30
H	\$25
I	\$10

The University Book Store does know its customers' reservation prices, and it knows that customers with reservation prices above \$45 never go to the Book Store's T-shirt sale, while the other customers will go to the T-shirt sale whenever it is available. The University Book Store can only set two prices for UW T-shirts, one is the list price, and the other is its on-sale price. In order to maximize profits, what is the list price and on sale price the University Book Store should charge for its UW T-shirts? Show the procedure you used to find your answer. Assume that the marginal cost of producing a T-shirt is \$0.

4. First Degree Price discrimination vs. Entry Fee

Kollege Club is holding a party on Saturday night. An individual's demand for drinks is given by the equation $P=15-Q$. Suppose Kollege Club is a monopolist offering only one kind of drink with a constant marginal cost of \$5 and there is no fixed cost.

- If Kollege Club were able to perfectly price discriminate, how many drinks would it sell? What range of prices would it charge? Is there Consumer Surplus and deadweight loss if Kollege Club perfectly price discriminates? Explain your answer.
- Suppose in order to get in the party, people need to pay an entry fee and then, once they are admitted to the Kollege Club all drinks sell for a single price. How much will Kollege Club charge for a drink and how much is the entry fee so that Kollege Club maximizes its profit? Is there a Consumer Surplus and deadweight loss when Kollege Club implements this plan? Explain your answer.

5. Game Theory

Please look at the following table:

		Player 2	
		L	R
Player 1	L	15,12	16,11
	R	10,7	2, 7

- What is player 1's strictly dominant strategy? Explain your answer.
- Is there any strictly dominant strategy for player 2? Explain your answer.
- What is the equilibrium you can predict from this game?