

Econ 211 > Problem Set 4

1. "Monopoly is good for producers but bad for consumers. The gains of the former offset the losses of the latter. On balance, there is no reason to think that monopoly is bad for the economy." Evaluate.
2. It has been argued that the development of the railroad in the middle of the nineteenth century substantially reduced the market power of many American manufacturing firms. Explain.
3. How are some firms able to earn economic profits year after year after year? Why doesn't the competitive process force economic profits to zero?
4. A monopolist produces 100 units of output where $MR = MC$ and charges a price of \$20. The average cost of 100 units is \$12. Draw this situation on a graph.
 - a) What is total revenue, total cost, and economic profit at this output level?
 - b) Suppose the government imposes a lump-sum tax of \$300 on the monopolist. How does the monopolist respond to this in terms of price and output? Illustrate graphically. What are its profits now?
5. A monopolist is producing at a point where its marginal cost exceeds its marginal revenue. How should it adjust its output level to increase its profit?
6. Do monopolies choose to produce on the elastic, inelastic, or unit elastic range of their demand curves? Why?
7. Monopolistic Firm:

Q	P	TR	MR	TC	MC	FC	VC	ATC	AVC	AFC	π
0	80	0	80	150	--			--	--	--	
10	75			350							
20	70			500							
30	65			700							
40	60			950							
50	55			1300							
60	50			1700							
70	45			2150							
80	40			2650							
90	35			3200							
100	30			3800							

- a) Complete the table.
 - b) What is the π -maximizing output and price?
 - c) Using your favorite spreadsheet, plot the following graphs (Q is on the horizontal axis):
 - Graph 1: TR, TC, VC, FC versus Q
 - Graph 2: P, MR, MC, AC, AVC versus Q
 - Graph 3: π versus Q
 - d) What is the lowest price at which the monopolist would be willing to operate at in the short run?
8. Is price discrimination harmful to the US economy? Explain why or why not. What three conditions are necessary for successful price discrimination?
 9. Assume that a software company has a monopoly on the type of software they produce. People can download the software from the internet. Given this, the marginal cost to the company of one more person downloading the software is zero. Since marginal cost is zero, should the monopoly provide the software free (a price of zero)? Explain using the concepts for profit maximization.

10. A price discriminating seller will charge a higher price to those market segments which have the relatively more inelastic demand. For each of the markets below, indicate which segment you think will be charged the higher price. Explain why you think that segment has a lower elasticity of demand.

- sales of new boats to those who presently own a boat, or those who do not own a boat.
- sales of movie tickets to children or adults.
- sales of airline tickets to business travelers or a couple on vacation.
- sales of cosmetic surgery to the poor or the rich.

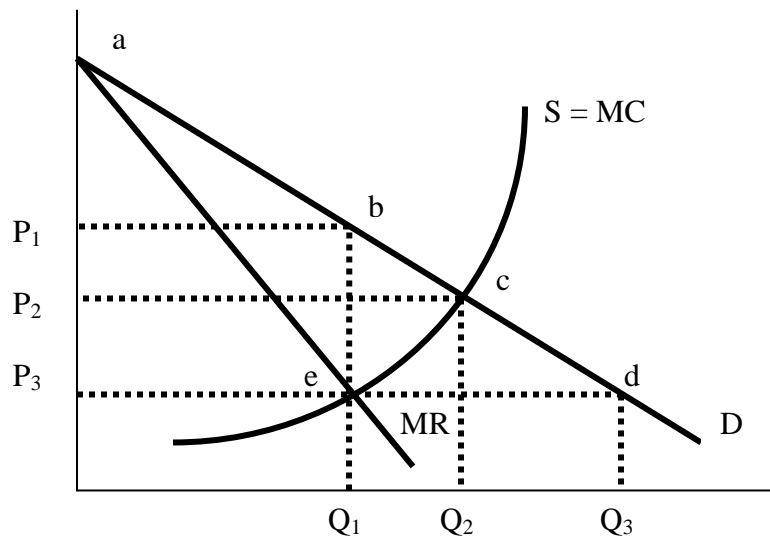
11. The following table indicates the prices various buyers are willing to pay for a Miata sports car:

Buyer	Maximum Price
Jessica	\$50,000
Connor	\$40,000
Steve	\$30,000
Nick	\$20,000
Nikki	\$10,000

The cost of producing the cars includes \$50,000 of fixed costs and a constant marginal cost of \$10,000.

- Graph the demand, marginal revenue, and marginal cost curves.
- What is the profit-maximizing output and price for a monopolist? How much profit does the monopolist make?
- If the monopolist can practice first-degree price discrimination, how many cars will she sell? How much profit will she make?
- What techniques could the monopolist use to employ price discrimination?

12. The figure below represents a perfectly competitive industry that is taken over by a single firm and operated as a single-priced monopoly.



- What was the competitive price and quantity?
- What is the monopoly price and quantity?
- What area represents consumer surplus under perfect competition? (Identify the relevant geometrical areas by their endpoints.)
- What area represents consumer surplus under monopoly?
- What area represents the deadweight loss of monopoly?

13. Suppose there are two classes made up of very similar students and students can choose which class they sign up for. In one class, each student receives the grade made on each test. In the other class, each student receives the class average as his or her grade. These policies are known by all. In what class would you expect the higher average grade? Explain.

14. Explain the nonrivalry and nonexcludability features of a pure public good. Why are both necessary for the good to be a pure public good?

15. Parsons Apartments has 100 resident who are all concerned about security. The table below gives the total cost per day of hiring a 24-hour security guard service and the marginal benefit per day to each of the residents.

Number of Guards	Total Cost of Guards	Marginal Benefit per Resident	Marginal Benefit to all Residents
1	\$300	\$10	
2	\$600	\$4	
3	\$900	\$2	
4	\$1200	\$1	

- Why is a security guard a public good for the residents of Parsons Apartments?
- Why will no guards be hired if each of the residents must act individually?
- Complete the last column of the table by computing the marginal benefit of security guards to all the residents combined.

16. Now suppose that the residents of Parsons form an Apartment Council that acts as a governing body to address security issues.

- What is the efficient number of guards? What is the net benefit of this amount?
- Show that the net benefit is less for either one less guard or for one more guard than the net benefit for the efficient number of guards.
- How might the Apartment Council pay for the guards it will hire?

17. Art, Bob, and Charlie own a lake in Michigan that they use for recreational purposes. A mosquito abatement program will benefit all. Art place a value of \$1, Bob places a value of \$19, and Charlie places a value of \$100 on a mosquito-free environment. A firm will spray the lake and charge each owner \$35.

- What decision would be reached under majority rule? Would the result be efficient?
- What decision would be reached if Art, Bob, and Charlie could engage in costless negotiations? Could unanimity be achieved?

18. An environmentalist argues that all pollution must be eliminated. How would you try to convince her that her position is both unreasonable and impractical?

19. What are the advantages of marketable permits compared to regulation of pollution where all firms are required to reduce pollution by a certain percent?

20. Factory A produces 1000 tons of sulfuric acid at a cost of \$10,000. For the people in the community, the production of 1000 tons of sulfuric acid causes an increase of \$5000 in medical payments, a loss of \$4000 in wages by being sick, and an increase of \$1000 in dry-cleaning bills. What are the private and social costs of the 1000 tons of sulfuric acid? Show your work.

21. Airport noise is certainly a negative externality. Why would people choose to live near airports?

22. A factory's production process creates sludge that pours into a river. This sludge makes it difficult to fish in the river, increasing the costs of the local fishermen by \$5000. The factory can install a water filter system for \$4100, and the fishermen can utilize a weighted fishing net system (to get under the sludge) for \$3250. Both systems would remedy the sludge damage to the fishermen.

- Suppose transactions costs are zero. If the factory is not liable and can continue to produce sludge, what outcome do you predict and why?
- Suppose transactions costs are zero. If the factory is assigned liability for sludge damage, what outcome do you predict and why?
- Now suppose transactions costs preclude the possibility of private bargaining between the factory and fishermen. If a pollution tax is levied on the factory with the proceeds given to the fishermen, then what outcome do you predict and why?
- Discuss the results of parts (a), (b), and (c) in terms of the Coase Theorem.

23. Fishermen who use nets to catch tuna also sometimes net dolphins, which, because they are mammals, drown before they can be released. Currently, the price and quantity of tuna determined by the market does not take into account the cost to society of killing the dolphins (marginal external cost). Listed below are market demand and supply schedules for tuna as well as the marginal external social costs associated with dolphins killed in the process of catching tuna. All costs and values are listed in terms of dollars per pound of tuna.

Quantity of tuna (1000s)	Consumer's valuation of tuna	Marginal private cost of tuna	Marginal external cost of dolphins
1000	\$5.50	\$1.75	\$2.05
2000	5.00	2.00	2.15
3000	4.50	2.25	2.25
4000	4.00	2.50	2.35
5000	3.50	2.75	2.45
6000	3.00	3.00	2.55
7000	2.50	4.50	2.65
8000	2.00	4.70	2.75

- What output and price would the free market generate? Why?
- What is the socially optimal output and price? Why?
- In order to obtain the socially optimal equilibrium, what would the appropriate per-pound tax on suppliers need to be? Of this tax, how much would consumers end up paying?

24. In a small town, two factories--factory A and factory B--each produce 20 units of pollution so that the total pollution is 40 units. Factory A can decrease its pollution at a constant marginal cost of \$60 per unit; factory B can reduce its pollution at a constant marginal cost of \$100.

- Suppose that the Environmental Protection Agency (EPA) determines that the efficient level of pollution in the town is 20 units. If the EPA requires each factory to decrease its pollution by 10 units, what is the total cost of reaching a total of 20 units of pollution? Show work.
- Suppose that the EPA introduces marketable pollution permits and allows each firm to produce 10 units of pollution. What is likely to occur? In particular, will factory A or B want to sell its permits to the other factory and is the other factory willing to buy them? If there is a potential buyer and seller of the permits, what is the price range in which the permits will trade?
- From a social standpoint, which is the more desirable policy: when the EPA requires equal reductions in pollution, or when it introduces marketable permits? Why is the one policy better than the other? Show any relevant calculations.

25. Consider two coastal communities. In the first community, there are a lot of independent fishing boats that are fishing the coastline. In the second community, there is one large fishing company that owns all of the boats that fish the coastline. Considering the idea of common property rights, in which community would you expect more fish to be caught? Explain why.