

Final Review Practice Problems

Consumer theory

1. The market for beer is represented by the following demand and supply functions, where Q is barrels of beer and Y is income:
$$Q_d = 200 - 4P_d + .1Y$$
$$Q_s = -50 + 6P_s$$
 - a. Is beer a normal or an inferior good? Explain.
 - b. If income is \$500, what will be the equilibrium price and quantity?
 - c. A \$10 tax per barrel is introduced. What will be the effect on the supply price, the demand price and the traded quantity?
 - d. Use a diagram to illustrate the effects of the tax on consumer surplus, producer surplus, and taxpayers. Indicate any deadweight losses.

2. Jane Austin has a fixed income each month and cannot borrow or save. In May, Jane buys 4 crumpets and 6 cucumber sandwiches. She pays six farthings for each crumpet and 1 farthing for each sandwich.
 - a. Draw a graph of her budget constraint, labeling the INTERCEPTS and SLOPE carefully. Draw an indifference curve through her optimal choice.
 - b. Alastair buys both crumpets and cucumber sandwiches at the same store as Jane. However, he likes crumpets more and buys 7 crumpets but only 1 sandwich. How does the size of his marginal rate of substitution (his marginal value of crumpets in terms of cucumber sandwiches) compare to Jane's?

3. Sandra's consumption of bread fell last year. Which of the following are potential explanations? (More than one answer may be correct.)
 - a. The price of bread rose and Sandra's demand for bread is elastic.
 - b. The price of bread rose and Sandra's demand for bread is inelastic.
 - c. Sandra's income fell and bread is a normal good.
 - d. Sandra's income fell and bread is an inferior good.
 - e. The price of cheese rose and cheese and bread are complements for Sandra.
 - f. The price of cheese rose and cheese and bread are substitutes for Sandra.

Producer theory

4. You own a firm in a competitive industry, where all firms are identical. Other firms may enter and exit, and the cost functions for firms in the industry will not change. The government is considering one of two policies:

A: A tax of \$500 per firm per year for all firms in the industry.

B: A tax of \$1000 per firm per year for all firms except yours

Which policy will you prefer? Consider only the long run effects. Explain your answer.

5. A firm is currently producing 600 units of output using 150 hours of labor and 50 hours of capital. The marginal product of labor is 10 units of output per hours, the marginal product of capital is 30 units of output per hour. If the wage rate for labor is \$5 per hour and the rental rate for capital is \$10 per hour then
- the firm's use of labor and capital is cost efficient
 - the firm can produce more output for the same total cost by using more labor and more capital
 - the firm can produce more output for the same total cost by using more labor and less capital
 - the firm can produce more output for the same total cost by using less labor and more capital
6. Dr. Aspen is a doctor who has identical costs to all other doctors in town. Like all other doctors, she has 500 appointments a year, and she charges patients \$100 for each. Assume that doctors are free to exit the profession and that a large group of similar doctors could also move to town and enter the profession. Entry or exit would not change the cost functions of any doctor (Constant cost industry). Assume all of the usual assumptions about shapes of cost curves apply.
- Medical malpractice rates are increasing next year to \$10,000 a year for all doctors. How will this affect the price Dr. Aspen charges and the number of patients that she sees in the long run?
 - Instead of (a), assume that Dr. Aspen just lost a medical malpractice case and must pay \$10,000 in damages every year, regardless of whether or not she stays in business. Assume that malpractice insurance rates do not change for her or for any other doctor. How will this affect the price she charges and the number of patients that she sees in the long run?

Equilibrium

7. You turn on the radio and hear about a new government policy in the gasoline market. Unfortunately, you were too late to find out what the policy is. You do hear that there are reports of long lines at the pump and of drivers bribing convenience store owners to get gasoline. Your friend tells you that the problems must be that the government has limited the quantity of gasoline that may be sold. Is you friend right? If not, what do you think the new policy might be?

8. Which of the following are potential results of a price floor for wages? (More than one answer may be correct.)
- Shortages in the labor market, with firms engaging in costly search activities and head-hunting.
 - Unemployment in the labor market, with potential workers competing engaging in costly search activities.
 - Firm discrimination on the basis of characteristics like personal connections or appearance.
 - A deadweight loss.
 - A reduction in producer surplus
 - An increase in producer surplus
9. Suppose demand and supply for apples is represented by

$$Q_D = 40 - 2P$$

$$Q_S = 2P + 20$$

What is the equilibrium price and quantity?

Suppose the government imposes a \$1 tax on apple suppliers. What is the new price to consumers, price to suppliers, and quantity traded? How large is the deadweight loss imposed by this tax?

Market failures: monopolies and market power

10. The XYZ firm is the only producer of TVs in the country of Slovenia. It faces the following demand and cost schedules:

| Q | P | Total Costs |
|---|-------|-------------|
| 0 | ----- | 0 |
| 1 | 100 | 20 |
| 2 | 80 | 30 |
| 3 | 60 | 50 |
| 4 | 40 | 90 |
| 5 | 20 | 150 |

- How many TVs should XYZ produce and at what price? Explain.
- The Slovenian government opens the TV market up to competition from other firms in other countries. XYZ is now a **price taker**, and faces a world price of \$40. What quantity should XYZ produce now?

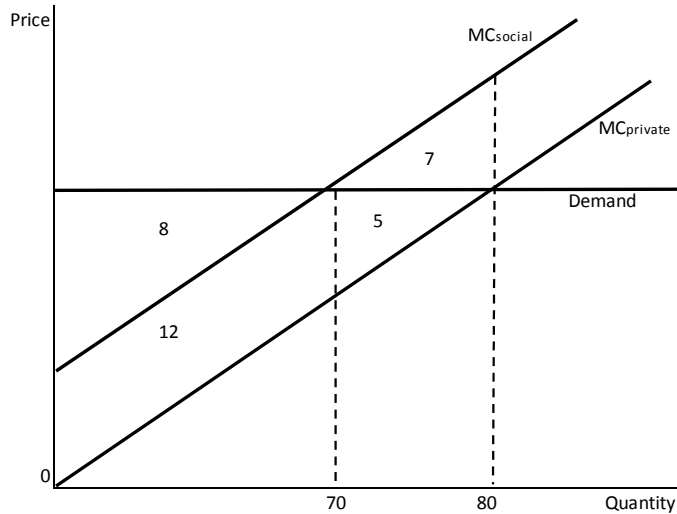
11. Explain the flaws in the following statement: “A monopolist will generally choose to produce the quantity of output where average costs are the lowest. This way the firm gets the highest markup possible: the difference between the price and the average cost is the largest. This will maximize the profits for the firm.”
12. Why do firms merge horizontally with one another? Do horizontal mergers increase producer surplus? Consumer surplus? Total surplus?
13. What is vertical integration? If Microsoft merges (a down stream seller of software) with an upstream software developer firm like Firefox, do both consumers and Microsoft benefit from the merger?
14. What is the Prisoner’s Dilemma? In what way does it apply to the strength of cartels?
15. What are the different assumptions included when we consider the following market types listed below? Also, what are some examples of each industry.
 - a. Perfectly competitive
 - b. Monopolistic Competition
 - c. Oligopoly
 - d. Monopoly
16. Assume that Bridger Bowl lift tickets are \$49 for a full-day adult pass and \$39 for a half-day adult pass (starting at noon).
 - a. Provide an explanation for this pricing schedule based on price discrimination.
 - b. Provide an explanation for this pricing schedule that is NOT based on price discrimination.

Market failures: Externalities

17. Is the following statement true or false? **Explain.**

A monopoly price creates a deadweight loss. If a monopoly produces a good with negative externalities, the combination will be one problem added to another: the generic deadweight loss of monopoly pricing will be added to the generic deadweight loss of negative externalities.

18. A competitive firm pollutes the air. The following graph shows the demand for the firm’s product and the private and social marginal cost curves. The numbers in the graph represent areas.



- a. Suppose there are no transaction costs and no legal penalty for polluting. It is also impossible for neighbors to move.
 - i. What quantity does the firm produce if only private marginal cost is accounted for?
 - ii. What is a possible deal that the might be struck between neighbors that would lead to a higher social welfare?
 - iii. What is the social gain from this transaction?

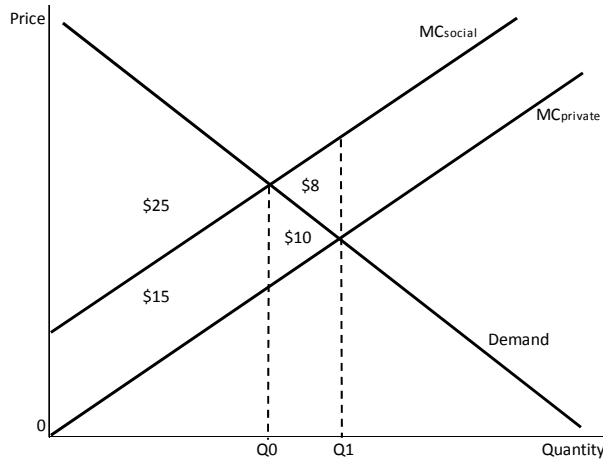
 - b. Suppose transaction costs are so high that negotiation is impossible, and that it would cost the neighbors \$6 to move. Under each of the following scenarios, determine whether or not the neighbors move. Also, determine how much the firm produces and compute the social gain. Which policy or policies are the most efficient?

Policy I: The firm faces no penalty for pollution.

Policy II: The firm pays an excise tax equal to the amount of the negative externality it causes; all tax revenue is paid to people who live 3,000 miles away.

Policy III: the firm must reimburse the neighbors for all pollution damage.

 - c. Repeat part (b) on the assumption that the cost of moving increases to \$25.
19. The widget industry is competitive and a source of localized air pollution (the pollution affects only people who live near the widget factories). The following diagram shows the demand for widgets and the private and social cost curves for the industry. There is no possible of negotiation to reduce pollution. It would cost the neighbors \$30 to move elsewhere. To maximize social welfare, should the firm be subject to a Pigou tax or should the nearby neighbors be forced to move?



20. A rancher and a farmer live in a valley. Every summer the rancher's sheep do \$500 worth of damage to farmer's crops. Hiring a local school kid to watch the sheep would prevent the damage. Consider each of the following four cases. In each case, would you expect that the school kid would be hired? If so, who would hire him? In which cases will an efficient outcome be reached?

- a. Hiring the school kid costs \$600 per summer (assume that the wage reflects the opportunity cost of time). The rancher must pay the farmer for any damage done by his sheep, since the law states that the rancher is liable for any damage done by untended sheep.
- b. Same as (a), except the school kid costs \$400.
- c. Hiring the school kid costs \$600 per summer. The rancher does not have to pay the farmer for any damage done by his sheep, since the law states that it is the owner's responsibility to protect his land.
- d. Same as (c), but the school kid costs \$400.

21. Describe the concepts of a Pigovian tax and the Coarse Theorem and how they apply to question 20 in providing socially optimal outcomes.

22. In Apria, a widget factory is located upriver from a fish hatchery. Production of widgets results in waste that is dumped in the river. In the absence of any pollution controls, each widget produced would result in \$50 in damages to the fish hatchery. The factory currently produces 1000 widgets. In Apria, the factory has the legal right to dump pollutants into the river.

In Babria, there is an identical widget and hatchery. However, in Babria, the hatchery has a legal right to compensation for polluted water.

Pollution scrubbing equipment can eliminate all pollution. The cost of that equipment is \$20,000 in either country.

What outcome is the most likely?

- a. The level of pollution will be higher in Babria than in Apria.
- b. The level of pollution will be the same in Babria than in Apria.
- c. The level of pollution will be higher in Apria than in Babria.
- d. More information is needed to compare the pollution levels in the two countries.

Market Failure: Common Property and Public Goods

23. What is the definition of a public good? Provide three or more examples of public goods.
24. Ten companies run shipping lines along the coast of New England. A comprehensive system of lighthouses is estimated to cost \$40 million dollars per year to run and save each individual company approximately \$5 million in reductions in lost shipping.
- a. Explain why no individual company will build the light house system.
 - b. Will the ten companies all be better off if the lighthouse system is contrasted and the ten companies split the cost of construction evenly?
 - c. What is the free rider problem? How can the free rider problem be solved in this situation?
25. A fisherman at Hardin Lake can catch 20 fish per day, provided he has the lake to himself. Two fishermen can catch 19 fish apiece per day, and three can catch 18 fish apiece per day. Other numbers are provided below. The opportunity cost of a day at the lake is 7 fish (i.e., the alternative activity is as valuable as 7 fish).

| Number of Fishermen | Fish per Day per Fisherman |
|---------------------|----------------------------|
| 1 | 20 |
| 2 | 19 |
| 3 | 18 |
| 4 | 17 |
| 5 | 15 |
| 6 | 13 |
| 7 | 10 |
| 8 | 7 |

- a. How many fishermen come to the lake? How many fish do they catch? What is the social gain from the existence of the lake?
- b. What is the optimal number of fishermen at the lake? What is the social gain if this optimum is achieved?
- c. What entrance fee leads to the optimal outcome?