

ECONOMICS 1
Problem Set 2

Due in your first section meeting in the week of Sept 29.

1. Hiroo is willing to pay \$10 for the first widget that he purchases each year, \$9 for the second, \$8 for the third, and so on down to \$1 for the tenth and nothing for the eleventh. The market price is \$3 per widget.
 - a) How many widgets will he buy, and what will be his consumers' surplus?
 - b) The price of a widget rises to \$5. How many widgets will he buy now, and how will his consumers' surplus change?
 - c) Can you state a generalization about the relationship between the consumers' surplus obtained and the price of a commodity?

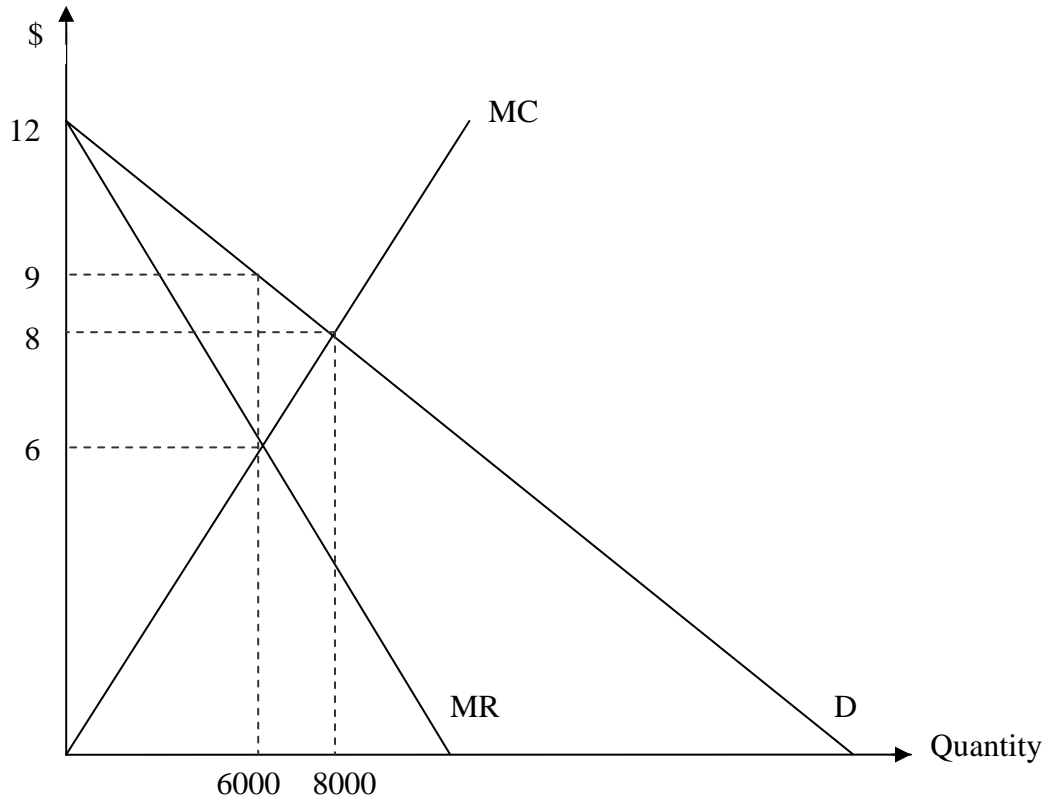
2. Suppose that you own a small T-shirt shop near campus. The only fixed cost involved in your business is renting of space, which comes to \$12 a week.
 - a) Given the following total cost figures, compute the average and marginal costs. Define MC as the extra cost of one *extra* unit rather than the MC of the last previous unit, such that, for example, the MC at 4 units is the cost of increasing from 4 to 5 units. Compute your answers to 2 decimal points -- pennies sometimes count in economics!

q	TC	q	TC
1	34	7	72
2	47	8	80
3	55	9	92
4	59	10	109
5	62	11	132
6	66	12	161

- b) Plot your results for AC and MC on a single graph.
- c) Suppose that you are operating in a perfectly competitive market for T-shirts. At the moment, the market price is \$18.
 - i) What is the profit-maximizing output for your firm? Explain why you chose that output level.
 - ii) Why would producing one more or one less shirt lower your profits?
 - iii) Now that you've maximized profits, calculate how much profit you actually make.

- d) Lots of people can produce T-shirts at the same costs as you. Do you think that the market price for T-shirts will remain at \$18? Explain what will happen to change the market price of T-shirts.
- e) Suppose that everyone who wanted to open a T-shirt shop near campus did so. What would the market price for T-shirts eventually be?
- f) In reality, it is probably not possible for everyone who wants to sell T-shirts near campus to do so. Explain what real-world factors would prevent entry into your T-shirt market? Explain how these factors would prevent the market price from dropping to the level you give in part (e).
3. In the problem 2c, price does not exactly equal marginal cost at the profit-maximizing output even though the firm is in a competitive market. This is because the firm cannot sell fractional units (such as 9.5 units), and so its ability to optimize is somewhat constrained. Suppose now that q is measured in thousands, such that, e.g., $q=8.743$ represents 8,743 T-shirts. Suppose also, that MC for outputs between $q=9$ and $q=12$ (ie., between 9,000 and 12,000) is given by this formula: $MC=5q-30$. How much output will the firm produce? Is $P=MC$ at this output level?
4. It is important to be able to determine whether an industry is competitive since, as we will see later in the course, we might want to regulate industries that are not competitive. Consider the retail food industry and determine for yourself whether, or the extent to which, you think this industry is competitive. Answering the following questions will help you in your analysis:
- a) Are there lots of firms or only a few?
- b) Is each firm small compared to the market?
- c) Do all firms charge the same prices? Or do some firms charge higher prices than others? If some firms charge higher prices, how do they get away with it (that is, why does anyone buy from them at the higher prices?)
- d) Do all firms face the same costs? That is, do they all have access to the same food suppliers, do they pay the same wages for workers, and so on?
- e) Is there free entry into the market? That is, is there anything preventing a new firm from entering and competing with existing firms?
- f) Do you think profits (economic profits, that is) are zero for retail food firms? How does your answer about profits relate to your answer to part (e).
- g) f. In light of all your answers, how competitive do you think the industry is? Is it sufficiently competitive that we need not worry about it? Or do you feel that it is sufficiently non-competitive that some form of government intervention is needed? (Obviously, there is no "right" answer here.)

5. Consider a monopolist who faces the following demand, marginal revenue, and marginal cost curves:



- a) The monopolist chooses the price that maximizes its profits. What price does it choose? How much output does it produce and sell? What is the marginal cost of additional output at this level of output? (A number is all that is required as the answer to each of these questions.) Note that price exceeds marginal cost.
- b) The socially optimal output is attained when price is equal to marginal cost. What is the socially optimal price? The socially optimal output?
- c) i) Calculate the gain in consumer surplus that is obtained if price is lowered from the monopolist's chosen level to the socially optimal level. Show your work.
- ii) Calculate the reduction in profits that the firm incurs if price is lowered from the monopolist's chosen level to the socially optimal level. Show your work. (Recall that the area under the marginal cost curve from the original output to the new output is the change in total costs for the firm.)

Note that the gain in consumer surplus that you calculated in (c.i) exceeds the reduction in profits that you calculated in (c.ii). That's why the output where price equals marginal cost is better than the outcome that the monopolist chooses.