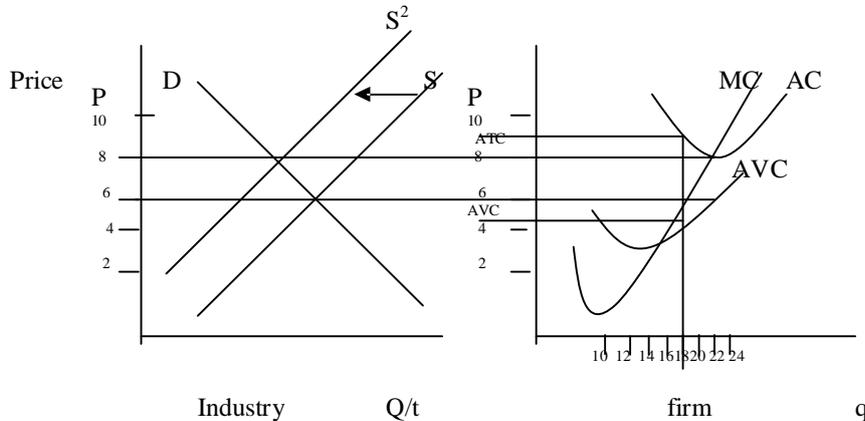


## In class exercises Chapter 8

1. Use the following graphs to answer the following questions.



- a) What is the price? What is the profit maximizing quantity?

$$P = \$6, q = 18$$

- b) At the profit maximizing quantity, is the firm making an economic loss or an economic profit, or zero economic profit?

$$\text{Loss } P < AC; 6 < 9$$

- c) In the short-run, will this firm shut down or stay open?

$$\text{Stay open } P > AVC; 6 > 4.25$$

- d) What happens in the industry, in the long-run, as a result of the profits or loss found in part b?

Firms exit until

- e) What would be the price in the long-run (after part b) - when the industry is in a STABLE EQUILIBRIUM?

Price is driven to \$8 (where  $P = MR = MC = \min ATC$ ), so  $S$  decreases to  $S^2$

- f) What are the fixed costs?

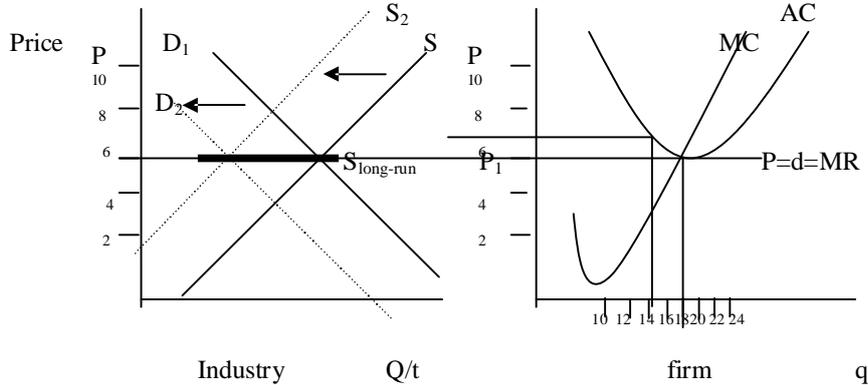
$FC = TC - TVC$  or  $AFC = AC - AVC$ , at  $q = 18$   $AC = \$9$  and  $AVC = \$4.25$ , so  $AFC = 9 - 4.25 = \$4.75$ . To get this to be a FC, we know  $FC = AFC * Q$ , so  $FC = \$4.75 * 18 = \$85.50$

NOTE: Your numbers may be a little different because the graph is not precise, that is fine, just be sure the equations are used appropriately.

- g) What are the variable costs?

$$VC = AVC * Q = \$4.25 * 18 = 76.50$$

2. Use the following graphs to answer the following questions. Assume this is a **constant cost industry**.



- a) Show the firm in a long-run equilibrium (that is, add the AC and find the profit maximizing quantity).

In PC,  $P = MR$ , profit max is to choose  $Q$  where  $MC = MR$ .  
Here  $P = 6$ , so  $q = 18$  and profit = 0

- b) Now suppose that the price of a complement increases, how will this impact the firm and the industry?  
Show this graphically.

$D$  decreases, this causes Price to fall (to around \$4), this causes firms in the industry to make economic losses ( $P < ATC$ ), so firms will leave

- c) Given the change in part b) what happens to the firm's profit maximizing quantity? How does the firm's profit change in the short-run?

$Q$  decreases (here it is about 14, but may be different in your graph depending on your demand shift) Economic losses ( $P < ATC$ )

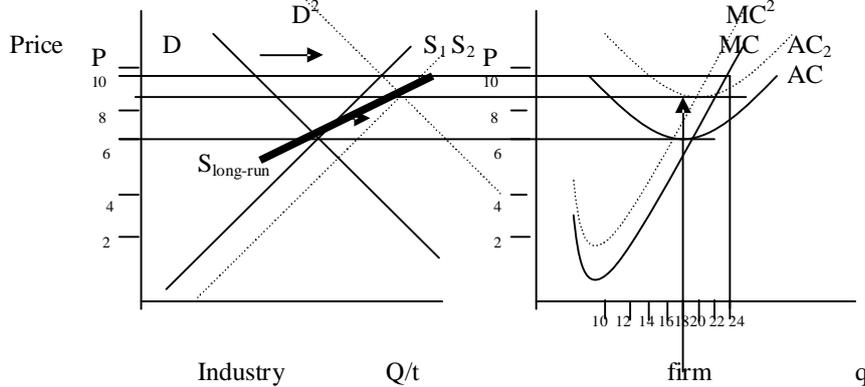
- d) What happens in the industry, in the long-run, as a result?

Firms exit

- e) Find the long-run supply curve, given the firm faces constant costs.

Connecting two points in which Profits = 0, and  $P = \min ATC$ , Long-run supply is perfectly elastic.

3. Use the following graphs to answer the following questions. Assume this is an **increasing cost industry**.



- a) Show the firm in a long-run equilibrium (that is, add the AC and find the profit maximizing quantity).

In PC,  $P = MR$ , profit max is to choose  $Q$  where  $MC = MR$ .

Here  $P = 6$ , so  $q = 18$  and profit = 0

- b) Now suppose that the price of a substitute increases, how will this impact the firm and the industry? Show this graphically.

$D$  increases (shifts right)

- c) Given the change in part b) what happens to the firm's profit maximizing quantity? How does the firm's profit change in the short-run?

It increases (here  $q = 24$ ), the firm makes an economic profit ( $P > AC$ )

- d) What happens in the industry, in the long-run, as a result?

Firms enter

- e) Find the long-run supply curve, given the firm faces increasing costs.

As firms enter, the entry drive up the cost so the  $MC$  and the  $AC$  both increase. This means that the increase in  $S$  is less than the increase found in problem #2; so overall Prices are higher than  $P_1$ .