PRACTICE CLASS Nr 9

Perfect Competition and the Supply Curve in the Short-Run

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Classroom Exercises

AP9-1-

We have the following information about a firm that operates in a perfectly competitive market.

Output (*Q*)	0	1	2	3	4	5	6	7	8	9
Total cost (*TC*)	100	150	160	166	184	205	232	275	324	615

a) Write a table with the firm's supply curve for quantities 0 to 9.

b) For what quantities will the firm have a positive profit? Explain.

c) What is the firm's pofit when the price is 27? Should the firm remain in business? Explain.

(Final Exam 26/01/2012 /P2)

AP9-2-

A firm in a perfectly competitive market has the following short-run costs:

Quantity	0	1	2	3	4	5	6
Total costs (€)	6	11	14	19	26	35	46

The firm sells its output to a market that has the following demand curve:

Price (€)	11	9	7	5	3
Quantity demanded	300	500	800	1200	1800

a) Find the marginal cost curve, and the avergate total cost and average variable cost curves.

b) Suppose that there are 100 firms with identical costs in the market. Find the market supply curve in the short run. Draw the supply and demand curves in the same graph.

c) Find the equilibrium price and the individual firm's profit.

(Final Exam 30/01/2007 /A3)

AP9-3-

In a perfectly competitive market each firm's short-run cost curve is $TC = 46 + 300Q + 25Q^2$. Demand is given by $Q^d = 1500 - p/3$, where Q^d is the quantity demanded and p is the price.

a) Find the expressions for the firm's variable cost, average cost, and marginal cost.

b) There are 100 firms in the market. Find the industry supply curve.

c) Find equilibrium price, industry quantity, and individual firm's quantity.

d) Draw the market equilibrium, calculate the producers' surplus, and show it on your graph.

AP9-4-

A perfectly competitive firm's cost curve is:

$$TC\,(Q) = 81 + Q^2$$

a) Is this the short- or long-run cost curve? Explain.

b) Find the expressions for the fixed cost, variable cost, average cost, and marginal cost.

c) The firm's total revenue is $RT = 24Q$. Find the profit-maximising quantity and the profit.

AP9-5-

The current price in a perfectly competitive market is €14. For a particular firm the break-even price is €12. If the market price falls to €11, the firm should:

a) Keep on producing if the average fixed cost is higher than €11.

b) Increase output.

c) Keep on producing if the average variable cost is less than €11.

d) Try to maintain output while waiting for the market price to increase back to €14.

(Intermediate test 17/12.2009, versão A,4)

AP9-6-

In a perfectly competitive market the assumption of free entry and exit implies that:

a) All firms have positive profits in the short run.

b) All firms have zero profits in the long run.

c) All firms have zero profits in the short run.

d) All firms have positive profits in the long run.

(Intermediate test 17.12.2009, versão A,2)

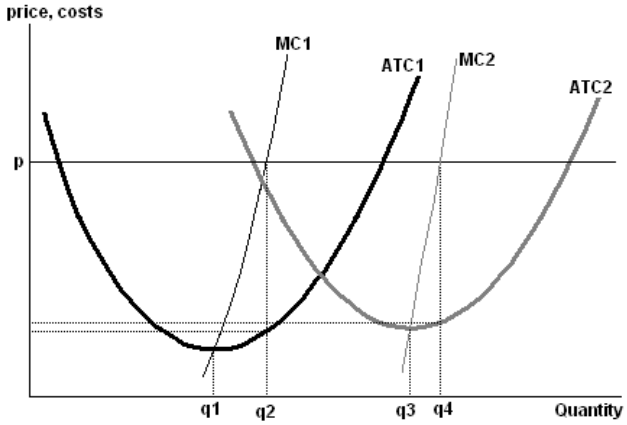
AP9-7-

1. **The market price that makes it optimal for a firm to produce a quantity such that the marginal cost is equal to the average total cost is called:**
   a) Shut-down price.
   b) Break-even price.
   c) Profit-maximising price.
   d) None of the others.

(Intermediate test 10.12.2011, versão A,12)

AP9-8-

Arthur is starting a firm, and he can install one or two assembly lines. The assembly lines are a fixed input. With one assembly line the marginal cost curve is MC1 and the average total cost curve is ATC1, as shown in the figure. With two assembly lines the marginal and average total cost curves are MC2 and ATC2. The firm will operate in a perfectly competitive market, and owing to barriers to entry the market price is forecasted to remain indefinitely at p (as shown in the figure). How many assembly lines should Arthur install and what quantity should he produce to maximise profit?

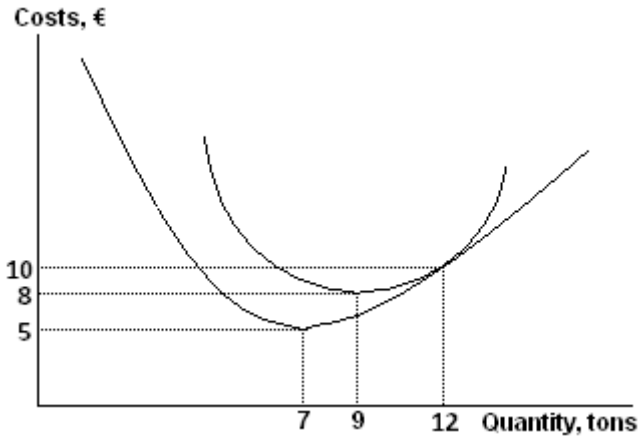


a) He should install two assembly lines and produce q4.
b) He should install two assembly lines and produce q3.
c) He should install one assembly line and produce q2.
d) He should install one assembly line and produce q1.

(Intermediate test 10.12.2011, versão A,16)

AP9-9-

In a perfectly competitive market the demand curve is given by $Q^d = 800 - 20p$. All firms have the same cost function, and this does not change as firms enter or exit the industry. The figure below shows one short-run and the long-run average cost curves derived from that cost function. What is the price and number of firms in the long-run equilibrium?



a) The price is €5 but the number of firms cannot be calculated.
b) The price is €8 but the number of firms cannot be calculated.
c) The price is €10 and the number of firms is 50.
d) All other alternatives are incorrect.

(Intermediate test 03.12.2012, versão A,5)

Home Exercises

AP9-10- Check Your Understanding 12-2, 1. (pg. 372).
AP9-11- Check Your Understanding 12-3, 1 a), b). (pg. 378)

AP9-12-

The shut-down price is equal to:

a) The minimum average fixed cost.

b) The minimum average total cost.

c) The minimum average variable cost.

d) The average cost when output is maximised.

(Intermediate test 24-25/11.2008, versão A, 1)

AP9-13-

Which statement is correct?

a) If the average variable cost curve is U-shaped, if for an output level the marginal cost curve slopes dow the average variable cost curve slopes down too.

b) If for an output level the marginal cost curve is upward-sloping the average cost curve is upward-sloping too.

c) The average cost reaches its minimum at the ouptup level that minimises marginal cost.

d) The fixed costs are constant by definition, so the average fixed cost is the same for every level of output.

(Intermediate test 17/12.2009, versão A,5)

AP9-14-

In a perfectly competitive market, the typical firm operates with the short-run total cost function $TC = q^2 + 5$

where TC is the cost, and q is the quantity produced. There are 100 identical firms in the market.

a) Find the typical firm´s supply curve and the market supply curve.

b) Suppose that the market demand is given by $Q^D = 200 - 50p$, where Q^D is the quantity demanded and *p* is the price. Find the equilibrium quantity and price.

c) Show in a graph what will happen if demand increases.

AP9-15-

A firm operates with short-run cost curve:

$$TC = 2Q^3 - Q^2 + 200\,,\ Q \geq 0\,,$$

where *Q* is the quantity produced per day, and *CT* is the total cost in euros. The firm operates in a perfectly competitive market, and the current price is €4/3. Find the short-run profit-maximising quantity. Explain and show your calculations.

AP9-16-

Problems 13 (pg. 383, 4th ed.)

Kate's Katering provides catered meals, and the catered meals industry is perfectly competitive. Kate´s machinery costs $100 per day and is the only fixed input. Her variable cost consists of the wages paid to the cooks and the food ingredients. The variable cost per day associated with each level of output is given in the accompanying table.

Quantity of meals	VC
0	$0
10	200
20	300
30	480
40	700
50	1,000

a) Calculate the total cost, the average variable cost, the average total cost, and the marginal cost for each quantity of output.

b) What is the break-even price? What is the shut-down price?

c) Suppose that the price at which Kate can sell catered meals is $21 per meal. In the short run, will Kate earn a profit? In the short run, will Kate earn a profit? In the short run, should she produce or shut down?

d) Suppose that the price at which Kate can sell catered meals is $17 per meal. In the short run, will Kate earn profit? In the short run, should she produce or shut down?

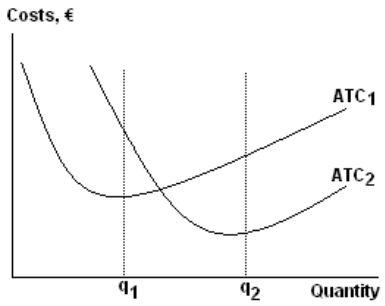
AP9-17-

(Final Exam 13.03.2015)

Maria grows sweet peppers on land she rents. She can rent one or two hectares of land only. The figure shows the average total cost curves for one and two hectares of land. What happens to her long-run average cost if she increases production from q_1 to q_2?

a) It falls.
b) It rises.
c) The information is not enough to answer the question.

d) All other alternatives are incorrect.



AP9-18-

The long-run industry supply curve is upward sloping if:

a) Firms operate with decreasing returns to scale.
b) Firms operate in the upward-sloping section of their marginal cost curves.
c) Firms require an inelastically-supplied input.
d) Firms operate with inflation that rises input prices over time.

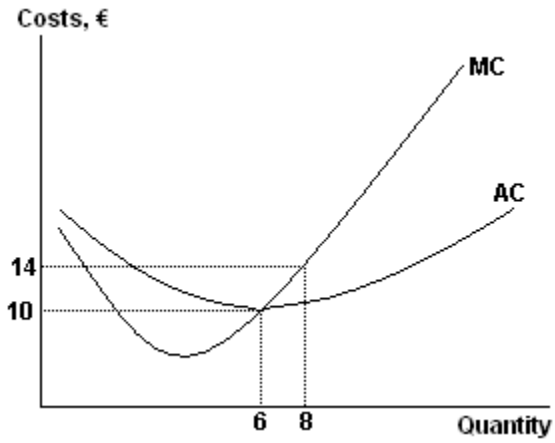
(Final Exam 13.03.2015)

AP9-19-

A certain market is perfectly competitive. Market demand is given by

$$Q^D = 988 - 10p.$$

All firms have the same cost function, and new firms can enter the industry and operate with same cost function as those already in the industry. The figure below illustrates the cost structure of every firm. There are no fixed costs, so the average total cost curve and the average variable cost curve coincide and are labeled AC in the figure. The industry is currently in a short-run equilibrium, with 106 firms selling 8 units each at a price of 14 euros per unit. What can we say about the market long-run equilibrium?



a) There will be more firms selling at a lower price, but we cannot tell the exact price or number of firms.
b) There will be more firms selling at a price of 10 euros, but we cannot tell the exact number of firms.
c) There will be 148 firms selling at a price of 10 euros.
d) We cannot make any of the other statements.

(TPC-04-Aquila – Dezembro 2011; 2011/12)