



AP Microeconomics 2001 Scoring Guidelines

The materials included in these files are intended for non-commercial use by AP teachers for course and exam preparation; permission for any other use must be sought from the Advanced Placement Program. Teachers may reproduce them, in whole or in part, in limited quantities, for face-to-face teaching purposes but may not mass distribute the materials, electronically or otherwise. These materials and any copies made of them may not be resold, and the copyright notices must be retained as they appear here. This permission does not apply to any third-party copyrights contained herein.

These materials were produced by Educational Testing Service (ETS), which develops and administers the examinations of the Advanced Placement Program for the College Board. The College Board and Educational Testing Service (ETS) are dedicated to the principle of equal opportunity, and their programs, services, and employment policies are guided by that principle.

The College Board is a national nonprofit membership association dedicated to preparing, inspiring, and connecting students to college and opportunity. Founded in 1900, the association is composed of more than 3,900 schools, colleges, universities, and other educational organizations. Each year, the College Board serves over three million students and their parents, 22,000 high schools, and 3,500 colleges, through major programs and services in college admission, guidance, assessment, financial aid, enrollment, and teaching and learning. Among its best-known programs are the SAT[®], the PSAT/NMSQT[™], the Advanced Placement Program[®] (AP[®]), and Pacesetter[®]. The College Board is committed to the principles of equity and excellence, and that commitment is embodied in all of its programs, services, activities, and concerns.

Copyright © 2001 by College Entrance Examination Board. All rights reserved. College Board, Advanced Placement Program, AP, and the acorn logo are registered trademarks of the College Entrance Examination Board.

**AP[®] MICROECONOMICS
2001 SCORING GUIDELINES**

Question 1

Correct answer:

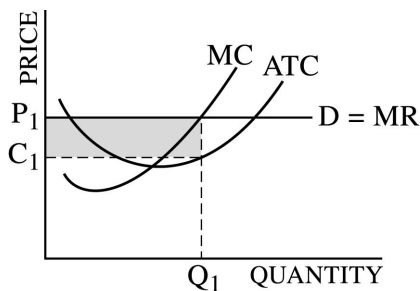
The firm has a perfectly elastic (or horizontal) marginal revenue curve that is equal to the market price. The firm produces the output level where marginal revenue equals marginal cost. The economic profit of the firm is the area bounded by the quantity produced multiplied by the difference between price and average total cost (P-ATC) at that output level.

With economic profits, new firms will enter the industry. The market supply will shift outward with the entry of firms, and market price will fall. The process continues until a long-run equilibrium is established. At this equilibrium, the market price is equal to the minimum of the long-run average cost of the typical firm. Each firm produces where $P=MR=MC$, which is the level of output that corresponds to the minimum of the long-run average cost. The firm makes zero economic profits.

A price control below the long-run equilibrium price but above the firm's average variable cost will result in short-run production. Since the price has fallen, the firm's marginal revenue falls. The firm's output level, where $MR=MC$, will also decrease. Since the firm is producing less output, total cost falls. Since both the firm's price and quantity have fallen, total revenue falls.

3+5+4 = 12

(a) 3 points



A correctly labeled graph of the firm's situation is sufficient for full credit on part (a). An explanation is not necessary. The breakdown is as follows:

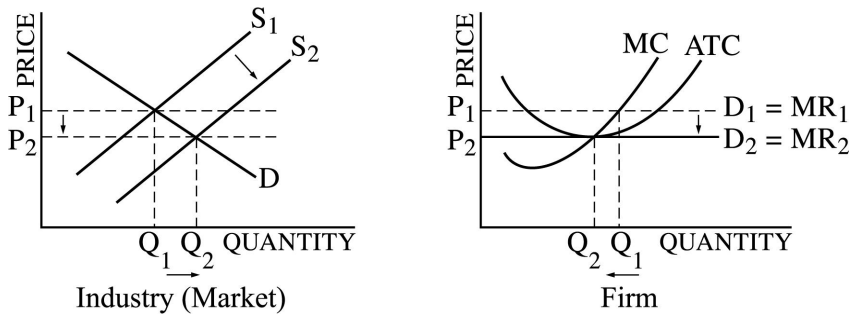
- (i) **1 point** A horizontal MR shown.
- (ii) **1 point** Show (and indicate) that output should be where $MR = MC$.

**AP® MICROECONOMICS
2001 SCORING GUIDELINES**

Question 1 (cont.)

- (iii) **1 point** Show the area of profit as the rectangle whose width is the distance between 0 and the equilibrium quantity and whose height is the distance between the $P(AR)$ and ATC at that quantity.

- (b) **(5 points in total)**



- (i) **3 points** The breakdown is as follows:

1 point showing correctly drawn side-by-side graphs of the firm and the market, with both graphs correctly labeled.

1 point showing a market supply curve shifting out and a market price decreasing, with this price being used in the firm graph.

1 point explaining that with economic profits, more firms enter the market.

- (ii) **2 points** The breakdown is as follows:

1 point showing the *industry* equilibrium price and quantity. Students can either use a vertical line from the x axis to the equilibrium point, and one from the equilibrium point to the y axis (and label each axis) or else they can mark the equilibrium point with a letter and somehow indicate that the point represents the equilibrium.

1 point showing the *long-run* equilibrium price and quantity for the firm at the minimum ATC , indicating it via either of the methods discussed above in b (ii).

- (c) **4 points** A graph is *not* necessary to answer this question. The point breakdown is as follows:

(i) **1 point** For indicating that marginal revenue has fallen because P has been lowered.

(ii) **1 point** For indicating that output has fallen because $MR = MC$ is at a lower q .

(iii) **1 point** For indicating that total costs fell *because* output fell.

**AP[®] MICROECONOMICS
2001 SCORING GUIDELINES**

Question 1 (cont.)

- (iv) **1 point** For indicating that price *and* quantity fell. It is *not* sufficient to state that merely one of the two fell: either both are explicitly stated, or else the student clearly shows on the graph that the new equilibrium has a lower P and Q and that because of this, total revenue falls.

**AP[®] MICROECONOMICS
2001 SCORING GUIDELINES**

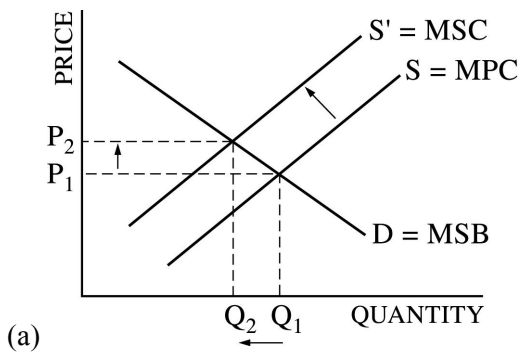
Question 2

Correct Answer:

The student should show a market supply curve that includes only private costs of production. For a given market demand curve, there will be an equilibrium price and quantity of output. There should be a second supply curve that incorporates all costs of production, including the external costs. The socially optimum level of output is found at the intersection of the market demand and the supply curve that incorporates all costs, both private and external. With the same market demand curve, at the social optimum, the equilibrium price should be higher and the equilibrium quantity lower. In essence, the unregulated private market will produce too much output at too low a unit price.

To achieve the socially optimum level of output the government could introduce a unit tax on output. If properly chosen, this tax could raise the supply curve with only private costs to intersect at the socially optimum output level. Alternatively, quantity controls or pollution permits could be used to correct the overproduction.

3 + 1 = 4 points



- (i) **1 point** A simple supply and demand diagram, correctly labeled, is sufficient for full credit.
- (ii) **1 point** Recognizing that the negative externality results in a difference between the private supply curve and the socially optimum supply curve.
- The second supply curve must be labeled “socially optimal” or MSC or something to that effect.
 - They need not explicitly identify the externality.
 - Simply labeling curves S1 and S2 w/o an explanation is insufficient.
 - A firm graph is incorrect.

The difference in two supply curves *must be due* to the existence of external costs:

- $MSC > MPC$
- Cost not accounted for in the private market
- $S^{\text{with external costs}} > S^{\text{private}}$

They can **not** get credit for shifting supply due to a tax — it confuses causality.

**AP[®] MICROECONOMICS
2001 SCORING GUIDELINES**

Question 2 (cont.)

- (iii) **1 point** Showing a higher price and lower quantity in the socially optimum equilibrium.
- (b) **1 point** Various answers will suffice:
- A unit tax
 - Quantity restriction
 - Effective price ceiling (*not* a price floor) that leads to production of Q_1
 - Pollution permits

**AP® MICROECONOMICS
2001 SCORING GUIDELINES**

Question 3

Correct Answer:

Worker number 3 has the highest marginal product (i.e., $60 - 35 = 25$ cars washed). With additional workers the marginal product falls. This is consistent with the Law of Diminishing Returns. That law states that as more units of a variable input (labor) are employed with a fixed input, output will eventually increase at a decreasing rate. The sixth worker would never be hired since the marginal product of that worker is negative ($80 - 85 = -5$ cars). A firm would never hire a unit of an input that reduces total output. The firm would be willing to pay the fourth worker as much as its marginal revenue product or \$90 per day found by multiplying the price of a car wash by the number of cars washed by the fourth worker (i.e., $\$6 \times 15 = \90).

1 + 2 + 1 + 1 = 5 points in total

- (a) **1 point** 3rd worker
- (b) **1 point** Diminishing marginal returns
1 point Definition of diminishing marginal returns that includes both variable **and** fixed inputs
- (c) **1 point** Negative marginal product for the 6th worker
Also accepted: negative returns, output falls, or $MRP < 0$.
- (d) **1 point** \$90 ($P \times MP$ or $\$6 \times 15 = \90)