AP® Microeconomics
2003 Scoring Guidelines

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Question 1

Correct Answers:

Part a: The market graph should have a downward-sloping demand curve and an upward - sloping supply curve with an equilibrium price and quantity clearly labeled. The firm graph should have a perfectly elastic (or horizontal) demand curve at the equilibrium market price. The firm's profit-maximizing quantity is found at the intersection of this demand or marginal revenue curve with the firm's marginal cost curve.

Part b: The firm's profits are represented by the rectangle that has a height (or vertical distance) of (P-ATC) multiplied by the firm's profit-maximizing output or q.

Part c: With profits being earned, new firms will enter the smoke alarm market. The market supply will increase (shift out to the right) and the equilibrium price will fall and quantity will increase. As the market price falls, the firm has a downward shift in its horizontal demand curve. The process continues until price of output has fallen to the minimum of the average total cost of the firm.

Part d: With a positive consumption externality in the market for smoke alarms, the demand curve with marginal social benefits should lie above the demand curve with only marginal private benefits. Thus, the socially optimal output level will exceed the output level produced by an unregulated private market.

Part e: To increase the market output to the socially optimal output, the government could subsidize the consumption or production of smoke alarms.

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Question 1 (cont'd)

Grading Rubric:

Point allocations: **(12 points: 4+1+4+2+1)**

(a) 4 points:

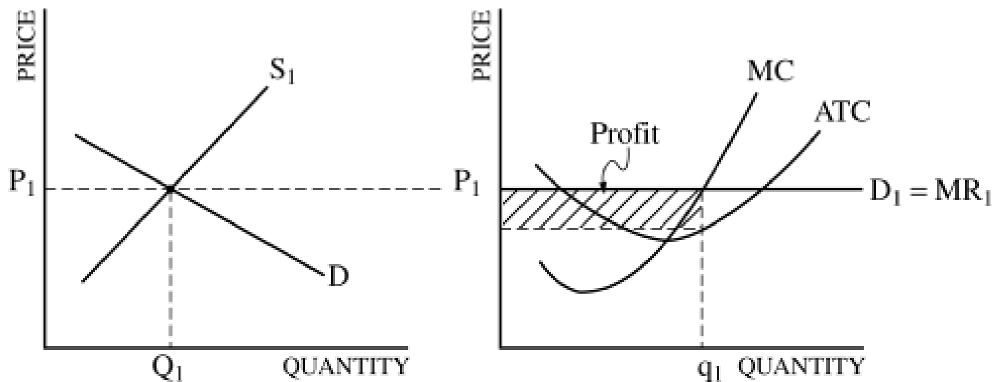
1 point for the market graph (S, D) with a downward-sloping demand curve and an upward sloping supply curve.

1 point for correctly labeling equilibrium P and Q for the market.

1 point for the firm graph (Horizontal D or P curve).

1 point for applying MR=MC to find equilibrium quantity.

- MR must be logically consistent with demand curve



(b) 1 point for showing the AREA of economic profit for the firm.

- Must use P, ATC, and q.

(c) 4 points: (2 +2)

(i) 2 points:

1 point for showing an increase in supply on market graph (resulting from the entry of new firms).

1 point for showing both a lower P and higher Q due to an increase in supply.

(ii) 2 points:

1 point for the downward shift in the firm's demand curve (P or MR or D)

1 point for q (for firm) where P = min ATC for firm

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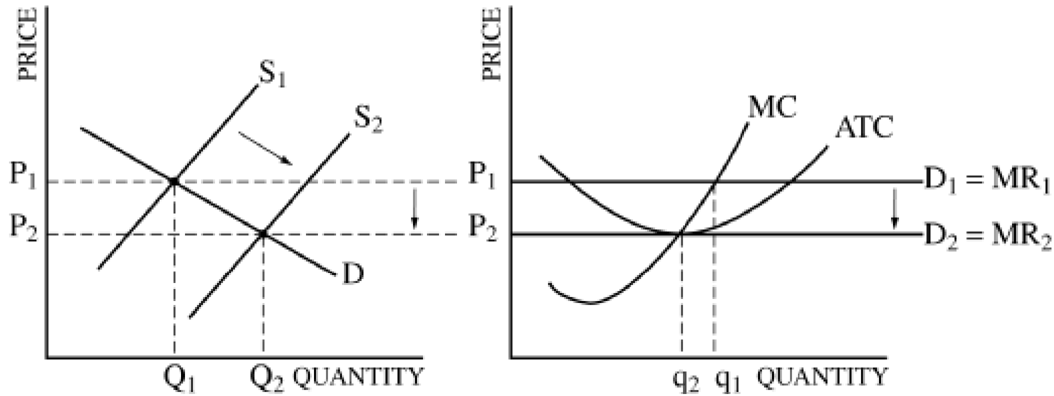
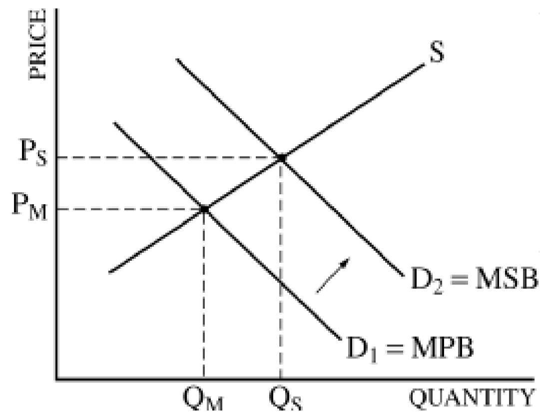
Question 1 (cont'd)



(d) 2 points:



1 point for showing that $Q_s > Q_m$.

1 point for having two marginal benefit curves: one with and without the positive externality.

(e)1 point for any of the following: Subsidize sellers or buyers, mandatory smoke alarm system, or tax relief.

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Question 2

Correct Answers:

Part a: For the monopolist, a correctly labeled graph should show a downward-sloping demand curve with a marginal revenue curve that lies below the demand curve. The monopolist's profit-maximizing output is found at the intersection of marginal revenue and marginal cost. The price is found on the demand curve, above the quantity produced. The firm's profits are represented by the rectangle that has a height (or vertical distance) of (P-ATC) multiplied by the profit-maximizing output or Q.

Part b: Marginal revenue is less than price since to sell additional units of output, the monopolist must lower price on all units of output sold.

Part c: Consumer surplus is the area bounded vertically by the difference between the demand curve (willingness to pay) and the monopolist's price over the number of units sold by the monopolist. The deadweight loss from monopoly is the combination of consumer and producer surplus that is lost when comparing the monopoly output to the output that would be produced under competitive conditions (where P=MC).

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Question 2 (cont'd)

Grading Rubric:

Point allocations: **(7 points: 4 + 1 + 2)**

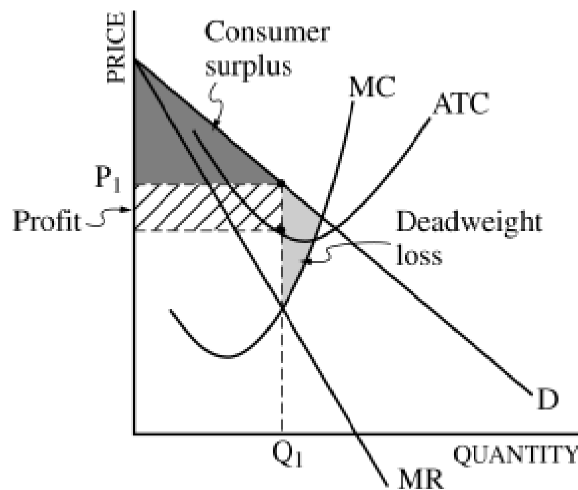
(a) 4 points

1 point for correctly labeled graph with downward-sloping demand curve AND marginal revenue curve below demand.

1 point for indicating Q at MR=MC.

1 point for finding the appropriate P on the demand curve directly above MR=MC output.

1 point for area of profit (must use P, ATC, and Q).



(b) 1 point - the monopolist must lower its price on all units to sell addtional quantities so MR<P.

(c) 2 points

1 point for indicating correct area for consumer surplus.

1 point for indicating correct area for deadweight loss.

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Question 3

Correct Answers:

Part a: The marginal revenue product of labor is the change in total revenue associated with the change in output following a unit change in the employment of labor.

MRP of labor = MR (or P of output) x MPP of labor.

Part b: The perfectly competitive labor market will have a downward-sloping labor demand curve and an upward-sloping labor supply curve. There will be an equilibrium wage and quantity of labor. The firm will be a wage taker and have a perfectly elastic labor supply at the market wage rate. The firm's labor demand curve is its marginal revenue product of labor curve. Thus, the profit-maximizing firm will hire the amount of labor associated with the intersection of its marginal revenue product of labor curve and its horizontal labor supply curve. The firm will pay each unit of labor the market wage.

Part c: With an increase in labor productivity that affects only Company XYZ there will be no perceptible change in labor market. The equilibrium wage stays the same. Company XYZ will have an outward shift in its marginal revenue product of labor (or labor demand) curve, leading to more employment at the unchanged market wage.

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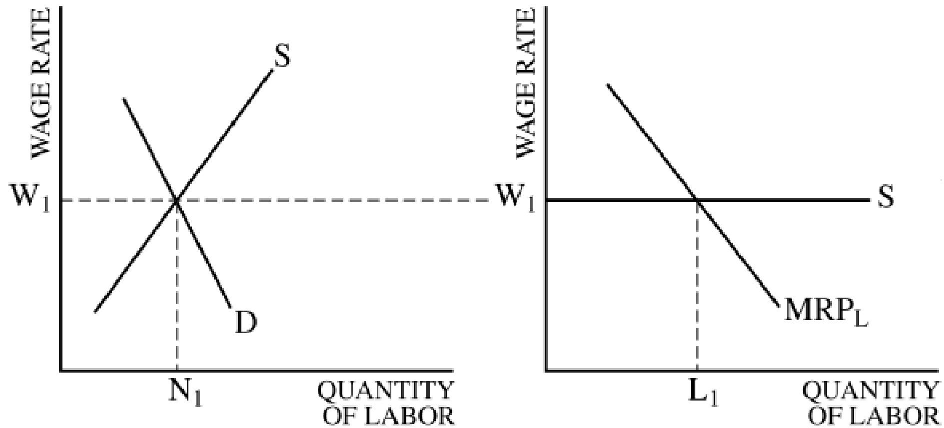
Question 3 (cont'd)

Grading Rubric:

Point allocations: **(7 points: 1+4+2)**

(a) 1 point - definition: the additional revenue from hiring an additional worker or MRP=MP x MR or MRP=MP x P

(b) 4 points:



1 point for the correctly labeled labor market graph showing equilibrium wage.

1 point for the firm graph indicating a downward-sloping demand (MRP_L) curve.

1 point for the horizontal labor supply curve for the firm.

1 point for showing quantity of labor for the firm at the intersection of labor supply and labor demand.

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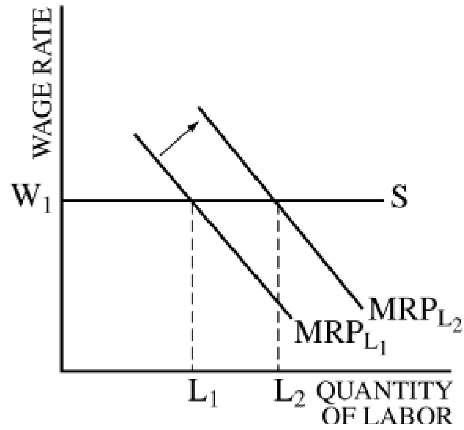
Question 3 (cont'd)

(c) (2 points)

1 point - wage rate for the firm remains constant at the original wage.

1 point - the number of worker hired by XYZ increases because XYZ's MRP increases or labor demand curve shifts out.



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