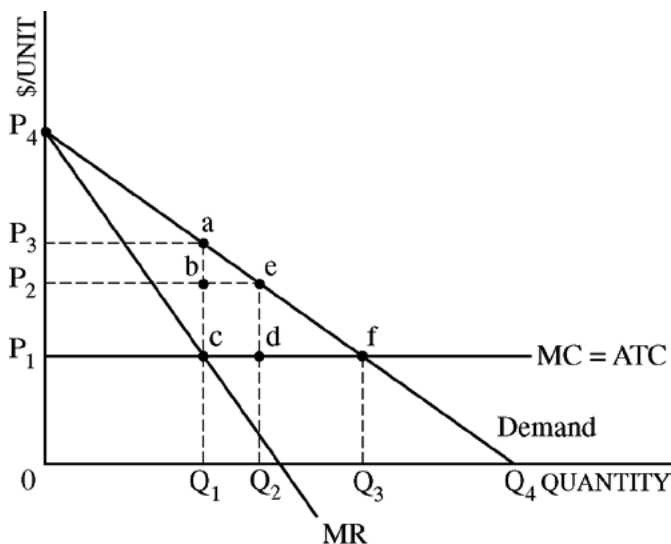


# AP<sup>®</sup> MICROECONOMICS 2013 SCORING GUIDELINES

## Question 1

**10 points** (4 + 2 + 2 + 1 + 1)



(a) 4 points:

- One point is earned for identifying the quantity,  $Q_1$ .
- One point is earned for identifying the price,  $P_3$ .
- One point is earned for identifying the area that represents the profit earned,  $P_1P_3ac$ .
- One point is earned for identifying the area that represents the deadweight loss,  $acf$ .

(b) 2 points:

- One point is earned for identifying the quantity produced,  $Q_3$ .
- One point is earned for identifying the area that represents the total revenue received,  $P_4fQ_30$ .

(c) 2 points:

- One point is earned for identifying the socially efficient quantity,  $Q_3$ .
- One point is earned for identifying the area that represents the consumer surplus,  $P_1P_4f$ .

(d) 1 point:

- One point is earned for stating that the monopolist is earning zero economic profit because the price equals ATC.

(e) 1 point:

- One point is earned for stating that point  $f$  is in the inelastic portion of the demand curve because MR is negative.

ANSWER PAGE FOR QUESTION 1

a) i.  $Q_1$  is the monopolist's quantity output

ii  $P_3$  is the unregulated monopolist's price

iii The profit earned by the monopolist is the rectangle  $P_3 P_1 C A$

iv The deadweight loss is the triangle formed by the points  $ACF$

b) i. If the monopolist can perfectly price discriminate, the quantity produced will be equal to  $Q_3$

ii The total revenue received by the monopolist will be the <sup>trapezoid</sup> triangle formed by the points  $P_4 O Q_3 F$

c) i. The socially efficient quantity (where supply = demand) is at  $Q_3$ .

ii The consumer surplus at the socially efficient quantity equals the triangle formed by the points  $P_4 P_1 F$

d) When the monopolist is facing regulation to produce at the socially efficient level, it will earn zero economic profits because at this point supply (or marginal cost) equals demand, but more importantly, the Average Total Cost equals the price the product is <sup>sold</sup> at. Therefore, the monopolist will only make normal profits and make zero economic profits.

e) Point  $F$  is on the inelastic portion of the demand curve because at point  $F$  marginal revenue is less than zero, and the  $\frac{\% \Delta Q}{\% \Delta P}$  will be less than one.

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A)

i)  $Q_1$ ii)  $P_3$ iii)  $(P_3 \times Q_1) - (P_1 \times Q_1)$ iv)  $\Delta ACF$ b) ~~10/1~~i)  $Q_4$ ii)  $(P_1 \times Q_3) + ((P_2 \times Q_2) - (P_1 \times Q_2)) + ((P_3 \times Q_1) - (P_2 \times Q_1))$ 

c)

i)  $Q_3$ ii)  $\Delta DEF$ D) zero economic profit because his  $ATC = P$ .e) elastic because everything below  $P_2$  on the curve is considered elastic.

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1

- (a) i) Quantity of output =  $Q_1$   
 ii) Monopolist's price =  $P_3$   
 iii) Profit =  $P_3 a P_1 c$   
 iv) Deadweight loss =  $abc$

- (b) i)  $Q_4$   
 ii)  $P_3 a P_2$

- (c) (i)  $Q_3$   
 (ii)  $P_4 P_2 e$

(d) ~~It~~ ~~is~~ ~~not~~ ~~earning~~ ~~zero~~ economic profit because it's producing at the socially optimal quantity, thus breaking even at  $MC = MR$ .

(e) It is the elastic portion of the demand curve, because the quantity at point P will only be demanded if the price is decreased to  $P_3$ .

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# AP<sup>®</sup> MICROECONOMICS

## 2013 SCORING COMMENTARY

### Question 1

#### Overview

This question determined students' ability to work with the monopoly model. It tested for an understanding of how price and quantity are determined, how profits are calculated, and how deadweight loss is identified for an unregulated monopolist. The question then examined students' knowledge of the price, quantity, and total revenue under conditions of perfect price discrimination. The question also determined whether students could identify the quantity produced and the profit received by a regulated monopolist. Lastly, the question tested students' understanding of the relationship between revenue and the elasticity of demand.

#### Sample: 1A

**Score: 10**

The student earned all 10 points for correctly answering all parts of the question.

#### Sample: 1B

**Score: 6**

The student correctly answers all of part (a) and earned 4 points for identifying the quantity  $Q_1$ , price  $P_3$ , the area for the profits  $P_1P_3acP$ , and the area for the deadweight loss  $acf$ . The student correctly answers part (c)(i) and earned 1 point for identifying the socially efficient quantity  $Q_3$ . The student correctly answers part (d) and earned 1 point for stating that the firm will earn zero economic profit because average total cost equals to price ( $ATC=P$ ).

#### Sample: 1C

**Score: 3**

The student correctly answers parts (a)(i) and (a)(ii) and earned 2 points for identifying the quantity  $Q_1$  and the price  $P_3$ . The student correctly answers part (c)(i) and earned 1 point for identifying the socially efficient quantity  $Q_3$ .