



3. The graph shows the cost and revenue curves for an unregulated, profit-maximizing monopoly.
- Is the firm shown in this graph a natural monopoly? Explain.
 - Using the labeling from the graph, identify the area representing the deadweight loss for this profit-maximizing monopoly.
 - In order to improve resource allocation, the government sets a price that results in the firm earning zero economic profit.
 - Using the labeling from the graph, identify the price and resulting quantity the firm would produce.
 - Will this government policy eliminate the deadweight loss? Explain using labeling from the graph.
 - Instead, the government decides to set a price that results in the socially optimal quantity of output. Will the firm earn positive, negative, or zero economic profit? Explain using labeling from the graph.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

Question 3: Short**5 points**

(a) State yes and explain that this firm is a natural monopoly because it experiences decreasing average total costs over the entire effective demand for its product. **1 point**

(b) State the area of deadweight loss is equal to **ONE** of the following areas: **1 point**

- bfg
- $\frac{1}{2} \times (P_5 - P_1) \times (Q_4 - Q_2)$

(c)(i) State the regulated price is P_3 and the regulated quantity is Q_3 . **1 point**

(ii) State no and explain with **ONE** of the following. **1 point**

- Area cjc is the remaining deadweight loss.
- The deadweight loss is reduced by area bfjc but is not eliminated completely.
- P_3 is greater than (or not equal to) marginal cost at Q_3 .
- Q_3 is less than (or not equal to) the socially optimal quantity Q_4 .

Total for part (c) 2 points

(d) State the firm will earn negative economic profit and explain with **ONE** of the following: **1 point**

- At the socially optimal quantity, Q_4 , average total cost (P_2) is greater than price (P_1).
- At the socially optimal quantity, Q_4 , the area of negative economic profit is P_1P_2dg .
- At the socially optimal quantity, Q_4 , the area of negative economic profit is $(P_2 - P_1) \times Q_4$.

Total for question 3 5 points