

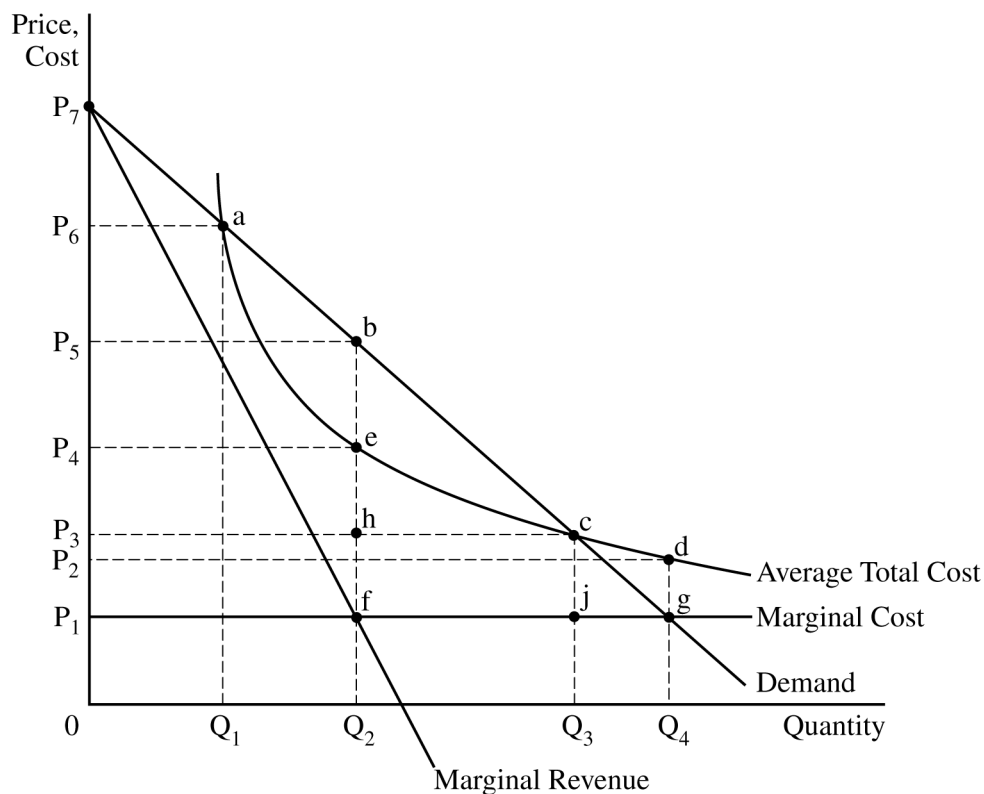
2. Keepdry produces and sells rain jackets in a perfectly competitive product market at the price of \$5 per jacket and hires all the workers it needs in a perfectly competitive labor market at the wage rate of \$15. Labor is the only variable input, and the firm's production schedule is provided in the table.

Number of Workers	Quantity of Output
0	0
1	9
2	20
3	27
4	32
5	34
6	35

- (a) Calculate the marginal revenue product of the second worker. Show your work.
- (b) Diminishing marginal returns will begin with the hiring of which worker?
- (c) Determine the profit-maximizing number of workers the firm should hire. Explain using marginal analysis.
- (d) Assuming Keepdry's fixed cost is \$40, calculate Keepdry's economic profit when hiring the profit-maximizing number of workers. Show your work.
- (e) Suppose Keepdry's fixed cost increases to \$80. Will the profit-maximizing number of workers hired in the short run increase, decrease, or stay the same? Explain.

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**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.**



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.

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**Question 2: Short****5 points**

- (a) Calculate the marginal revenue product (MRP) of the 2nd worker as \$55 and show your work. **1 point**

$$\text{MRP}_{(2\text{nd worker})} = (\text{Marginal Product} \times \text{Marginal Revenue})$$

$$= (20 - 9) \times \$5 = 11 \times \$5 = \$55$$

- (b) State that diminishing marginal returns will begin with the hiring of the 3rd worker. **1 point**

- (c) State that the profit-maximizing number of workers is 4 and explain that the MRP of the 4th worker (\$25) is greater than the marginal factor cost (MFC) of the 4th worker (wage = \$15), and that the hiring of the 5th worker would decrease profits because the MRP (\$10) is less than the MFC of the 5th worker (\$15). **1 point**

- (d) Calculate the economic profit as \$60 and show your work. **1 point**

$$\text{Economic Profit} = \text{Total Revenue} - \text{Total Cost}$$

$$\text{Economic Profit} = \text{Total Revenue} - \text{Total Fixed Cost} - \text{Total Variable Cost}$$

$$\text{Economic Profit} = (\$5 \times 32) - \$40 - (\$15 \times 4)$$

$$= \$160 - \$40 - \$60 = \$160 - \$100 = \$60$$

- (e) State that the number of workers hired will stay the same and explain that the increase in fixed cost does not affect the marginal factor cost of producing rain jackets. **1 point**

**Total for question 2    5 points**