2023

AP® Microeconomics

Sample Student Responses and Scoring Commentary Set 1

Inside:

Free-Response Question 3

- ☑ **Scoring Guidelines**
- ☑ **Student Samples**
- ☑ **Scoring Commentary**

Question 3: Short — 5 points

(a)	Calculate the total fixed cost as \$72 and show your work. $\text{Total Fixed Cost} = (\text{Average Total Cost} - \text{Average Variable Cost}) \times \text{Quantity}$ $\text{Total Fixed Cost} = (\$26 - \$8) \times 4 = (\$18 \times 4) = \$72$ OR $\text{Total Fixed Cost} = (\$21 - \$9) \times 6 = (\$12 \times 6) = \$72$ OR $\text{Total Fixed Cost} = (\$20 - \$11) \times 8 = (\$9 \times 8) = \$72$	**1 point**
(b)	Identify the price as \$14 and the profit-maximizing quantity as 6 units.	**1 point**
(c)	Calculate Hansel Hangout's economic profit at the profit-maximizing quantity as $-\$42$ and show your work. $\text{Economic Profit} = (\text{Price} - \text{Average Total Cost}) \times \text{Quantity}$ $= (\$14 - \$21) \times 6 \text{ units} = (-\$7 \times 6) = -\$42$ OR $\text{Economic Profit} = \text{Total Revenue} - \text{Total Cost}$ $= (\$14 \times 6) - (\$21 \times 6) = \$84 - \$126 = -\$42$	**1 point**
(d)	State that the market price of Good X will increase in the long run and explain that some firms will exit the market due to the negative economic profits, causing the market supply curve to shift to the left, increasing the market equilibrium price.	**1 point**
(e)	State that the quantity demanded of Good C will increase and explain that a positive cross-price elasticity of demand indicates that the two goods are substitutes in consumption, and an increase in the price of Good X will increase the demand for Good C, causing an increase in the quantity demanded of Good C.	**1 point**
	Total for question 3	**5 points**

Important: Completely fill in the circle that corresponds to the question you are answering on this page.

Question 1 ○ Question 2 ○ Question 3 ●

Begin your response to each question at the top of a new page.

a) $TFC = AFC \times Q = (ATC - AVC) \times Q$ (Q = at quantity that is being produced)

$= (21 - 9) \times 6 = \boxed{72}$

b) Price: $14

Measuring Q: 6 units

c) Econ $\pi = (P - ATC) \times Q$ (Q = at quantity that is being produced)

$= (14 - 21) \times 6 = -7 \times 6 = \boxed{-42}$ → econ loss

d) Because Hansel's Hangout is suffering from econ loss, firms will exit in the long run. When firms exit the market, the market supply will shift left since there are fewer firms producing Good X. As a result of this shift in supply, the market price of Good X will rise until firms, like Hansel's Hangout, are earning normal profit.

⇒ Price of good X rises

e) Because the cross-price elasticity of demand between Good X and Good C is positive, the goods are substitutes in consumption. Therefore, when the market price of Good X goes up, the Demand for Good C rises, so the quantity demanded of Good C will also go up.

Use a pen with black or dark blue ink only. Do NOT write your name. Do NOT write outside the box.

Important: Completely fill in the circle that corresponds to the question you are answering on this page.

Question 1 ○ Question 2 ○ Question 3 ●

Begin your response to each question at the top of a new page.

a. $21-9=\$12$ $6-0=6$ $12 \cdot 6 = \$72$

b. Price: \$14 Qty: 6

c. $(14-21) \cdot 6 = -\$42$

d. In the long run the price will stay the same as in perfectly competitive market structure firms are price takers, and demand is perfectly in-elastic.

e. A positive cross-price elasticity indicates that quantity demanded for good C will decrease as in order for the # to be positive, if price is staying constant Qd must decrease, see bellow.

$$\frac{\Delta \%\text{ price}}{\Delta \%\text{ qty}}$$

Important: Completely fill in the circle that corresponds to the question you are answering on this page.

Question 1 ○ Question 2 ○ Question 3 ●

Begin your response to each question at the top of a new page.

3)a. $20 \cdot 4 = 104$ $104 - 32 = 72$

$8 \cdot 4 = 32$

b. 14 and 6

c. $\$14 \times 6 = 84$

d. It will rise b/c more firm will leave since they are incurring a loss, leading to the remaining firms raising prices

e. Increase

Question 3

Note: Student samples are quoted verbatim and may contain spelling and grammatical errors.

Overview

The question assessed students' understanding of how Hansel Hangout, a typical profit-maximizing firm in a perfectly competitive market, would maximize profit in the short run and be affected by changes in the long run, and how the quantity demanded of a related good would be impacted.

The question provided a graph showing a perfectly competitive firm with a horizontal demand and marginal revenue (D = MR) curve, a marginal cost (MC) curve, an average total cost (ATC) curve that is above the demand curve, and an average variable cost (AVC) curve that is below the demand curve in the relevant range. The question required students to use their knowledge of profit maximization and cost curves to determine the firm's economic profit, how firm profitability affects the entrance or exit of firms in the market, and how the market price moves toward long-run equilibrium. The question also required students to use their knowledge of the relationship between a change in price and quantity demanded of two goods when analyzing the coefficient value for the cross-price elasticity of demand.

In part (a) students were asked to calculate Hansel Hangout's total fixed cost (TFC) and to show their work. This required students to use their knowledge to assert values from the graph. Students were required to calculate average fixed cost (AFC) by subtracting AVC from ATC at either a quantity of 4, 6, or 8 and to multiply this value by the quantity selected, resulting in TFC = $72.

Part (b) asked students to identify the price and profit-maximizing quantity for Hansel Hangout's Good X. Students were required to identify a price of $14 and a quantity of 6 units from the intersection of the MC and MR curves.

Part (c) asked students to calculate Hansel Hangout's economic profit and show their work with the quantity they identified in part (b). Students needed to identify, from the graph, the ATC at the quantity they provided in part (b) and to calculate the firm's profit as −$42.

Part (d) asked students to assert and explain what will happen to the price of Good X as the market adjusts to the long-run equilibrium. This required students to state that the market price will increase and explain that the negative economic profit as calculated in part (c) will lead to the exit of some firms from the market, thereby decreasing the market supply and increasing the market equilibrium price.

Part (e) asked students to assert and explain what will happen to the quantity demanded of Good C that has a positive cross-price elasticity of demand with Good X, based on the price change of Good X in part (d). This required students to assert that a positive cross-price elasticity of demand shows that the two goods are substitutes in consumption. Students were also required to explain that an increase in the price of Good X will increase the demand for Good C, causing an increase in the quantity demanded of Good C.

Question 3 (continued)

Sample: 3A
Score: 5

Part (a): 1 point

The response earned the point for part (a) because the response calculates total fixed cost as $72 and shows the work.

Part (b): 1 point

The response earned the point in part (b) because the response identifies a price of $14 and a quantity of 6.

Part (c): 1 point

The response earned the point in part (c) because the response calculates economic profit as $42 and shows the work.

Part (d): 1 point

The response earned the point in part (d) because the response states the price of Good X will increase and explains that firms will exit the market, shifting the market supply to the left.

Part (e): 1 point

The response earned the point in part (e) because the response states that the quantity demanded of Good C will increase and explains that Good X and Good C are substitutes in consumption and that an increase in the price of Good X will increase the demand for Good C.

Sample: 3B
Score: 3

Part (a): 1 point

The response earned the point in part (a) because the response calculates the total fixed cost as $72 and shows the work.

Part (b): 1 point

The response earned the point in part (b) because the response identifies a price of $14 and a quantity of 6.

Question 3 (continued)

Part (c): 1 point

The response earned the point in part (c) because the response calculates economic profit as $42 and shows the work.

Part (d): 1 point

The response did not earn the point in part (d) because the response states the price will stay the same.

Part (e): 1 point

The response did not earn the point in part (e) because the response states the quantity demanded of Good C will decrease.

Sample: 3C
Score: 2

Part (a): 1 point

The response earned the point in part (a) because the response calculates total fixed cost as $72 and shows the work.

Part (b): 1 point

The response earned the point in part (b) because the response identifies a price of $14 and a quantity of 6.

Part (c): 1 point

The response did not earn the point in part (c) because the response calculates economic profit as $84.

Part (d): 1 point

The response did not earn the point in part (d) because the response does not explain that the market supply curve will shift left due to the exit of firms.

Part (e): 1 point

The response did not earn the point in part (e) because the response does not explain that Good X and Good C are substitutes in consumption and that an increase in the price of Good X will increase the demand for Good C.