

2. The table shows Protecto’s short-run cost schedule of producing helmets.

Quantity of Helmets	Total Cost (\$)	Marginal Cost (\$)
4	200	30
5	235	35
6	275	40
7	320	45
8	375	55
9	440	65
10	520	80

Protecto produces and sells as many helmets as it wants at a market price of \$60 each, and Protecto’s fixed cost is \$80.

Part A

Identify the market structure in which Protecto sells helmets.

Part B

Calculate Protecto’s average variable cost when it produces 4 helmets. Show your work.

Part C

Calculate Protecto’s economic profit when it sells 5 helmets. Show your work.

Part D

Identify Protecto’s profit-maximizing quantity of helmets. Explain your answer using marginal analysis and numbers.

Part E

Protecto is earning positive economic profit in the short run. As the market for helmets adjusts to long-run equilibrium, will the market price of helmets increase, decrease, or remain the same? Explain.

2. The table provided shows the short-run production function for Lowen Feline, a profit-maximizing firm that produces cat food.

Number of Workers	Total Quantity of Cat Food (bags)
0	0
1	5
2	12
3	18
4	23
5	27
6	30
7	32
8	33
9	32

Lowen Feline sells as many bags of cat food as it wants at a market price of \$10 per bag and hires as many workers as it wants at a market wage of \$18.

(a) Lowen Feline's fixed cost is \$90. Calculate the average fixed cost if Lowen Feline hires 6 workers. Show your work.

(b) Assume labor is the only variable input to Lowen Feline. Calculate the marginal cost if Lowen Feline increases output from 27 to 30 units. Show your work.

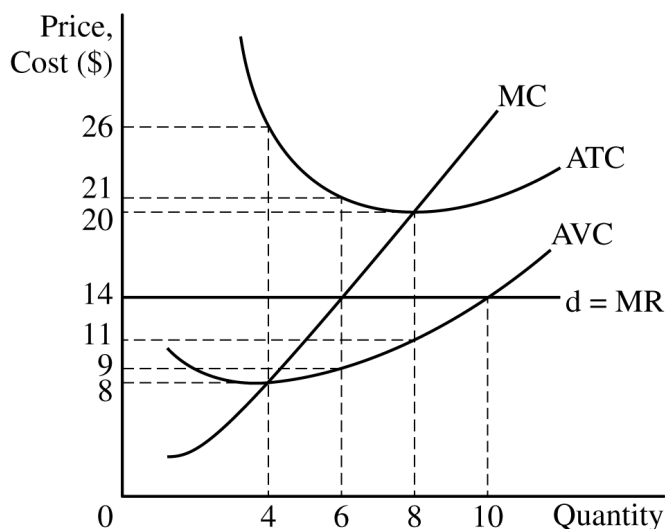
(c) With the hiring of which worker do diminishing marginal returns begin? Explain using numbers.

(d) Determine the profit-maximizing number of workers Lowen Feline will hire. Explain using marginal analysis.

(e) In the long run, a rival company, Gato Food, increases its production from 40 to 50 units, and its total cost increases from \$600 to \$900. Over the output range of 40 to 50 units, is Gato Food experiencing economies of scale, diseconomies of scale, or constant returns to scale? Explain using numbers.

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 provided shows the demand (d), marginal revenue (MR), average total cost (ATC), average variable cost (AVC), and marginal cost (MC) curves for Hansel Hangout, a typical profit-maximizing firm in a perfectly competitive market producing Good X.



- (a) Calculate Hansel Hangout's total fixed cost. Show your work.
- (b) Identify the price and Hansel Hangout's profit-maximizing quantity of Good X.
- (c) Calculate Hansel Hangout's economic profit at the quantity identified in part (b). Show your work.
- (d) As the market for Good X adjusts to the long-run equilibrium, what will happen to the price of Good X? Explain.
- (e) Assume the cross-price elasticity of demand between Good X and Good C is positive. Given the change in the long-run price of Good X in part (d), will the quantity demanded of Good C increase, decrease, or remain the same? Explain.

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.

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END OF EXAM

2. The table below shows the output a firm produces using different amounts of capital (K) and labor (L). The markets for capital and labor are perfectly competitive. The rental rate of capital is \$75 per unit, and the wage rate is \$200 per unit. In the short run, capital is fixed and labor is variable.

Labor	Output with K=1	Output with K=2
0	0	0
1	10	20
2	25	50
3	38	75

- (a) If the firm uses one unit of capital and one unit of labor, will it be operating with constant, increasing, or decreasing returns to scale? Explain using numbers from the table.
- (b) Assume now that the firm currently has two units of capital and is using three units of labor.
- Calculate the marginal product for the third unit of labor. Show your work.
 - Did the firm experience diminishing marginal returns with the addition of the third unit of labor? Explain using numbers from the table.
 - Calculate the firm's average total cost for its current level of production. Show your work.
 - If the firm's output is sold in a competitive market, what is the lowest output price at which the third unit of labor would be hired?