

Problem Set #8

Sonoma State University

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Economics 305-Intermediate Microeconomic Theory

Consider a firm with the following total cost function: $TC(Q) = Q^3 - 20Q^2 + 200Q$, where output is measured in thousands (i.e., 1,000 = 1 etc).

- (1) Derive the average total cost function.
- (2) Derive the marginal cost function.
- (3) What is the average total cost of producing five thousand units of output?
- (4) What is the marginal cost of producing five thousand units of output?
- (5) Given your answers to the two previous questions, what will happen to average total cost as output is marginally increased? Explain your answer.
- (6) What is the average total cost of producing twenty thousand units of output?
- (7) What is the marginal cost of producing twenty thousand units of output?
- (8) Given your answers to the two previous questions, what will happen to average total cost as output is marginally increased? Explain your answer.
- (9) What is the capacity of this firm?
- (10) What is the average total cost of output at capacity?
- (11) Show graphically the average total, and marginal cost functions. Be sure to indicate the points mentioned above.

Suppose instead the total cost function is given by: $TC(Q) = 20Q^2 + 200Q + 1000$

- (12) Derive the average total cost function.
- (13) Derive the marginal cost function.
- (14) What is the average total cost of producing five thousand units of output?
- (15) What is the marginal cost of producing five thousand units of output?
- (16) Given your answers to the two previous questions, what will happen to average total cost as output is marginally increased? Explain your answer.
- (17) What is the average total cost of producing twenty thousand units of output?
- (18) What is the marginal cost of producing twenty thousand units of output?
- (19) Given your answers to the two previous questions, what will happen to average total cost as output is marginally increased? Explain your answer.
- (20) What is the capacity of this firm?
- (21) What is the average total cost of output at capacity?
- (22) Show graphically the average total, average variable and marginal cost functions. Be sure to indicate the points mentioned above.