Class 2
Additional Excercies

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Fall 2019

Chapter 7 Exercise 8

- You manage a plant that mass-produces engines by teams of workers using assembly machines. The technology is summarized by the production function
- $q = 5\,KL$
- where q is the number of engines per week, K is the number of assembly machines, and L is the number of labor teams. Each assembly machine rents for r $10,000 per week, and each team costs w $5000 per week. Engine costs are given by the cost of labor teams and machines, plus $2000 per engine for raw materials. Your plant has a fixed installation of 5 assembly machines as part of its design.
- **a.** What is the cost function for your plant—namely, how much would it cost to produce q engines? What are average and marginal costs for producing q engines? How do average costs vary with output?
- **b.** How many teams are required to produce 250 engines? What is the average cost per engine?
- **c.** You are asked to make recommendations for the design of a new production facility. What capital/ labor (K/L) ratio should the new plant accommodate if it wants to minimize the total cost of producing at any level of output q?

Chapter 7 Exercise 9

- The short-run cost function of a company is given by the equation TC = 200 + 55*q*, where TC is the total cost and *q* is the total quantity of output, both measured in thousands.
- **a.** What is the company's fixed cost?
- **b.** If the company produced 100,000 units of goods, what would be its average variable cost?
- **c.** What would be its marginal cost of production?
- **d.** What would be its average fixed cost?
- **e.** Suppose the company borrows money and expands its factory. Its fixed cost rises by $50,000, but its variable cost falls to $45,000 per 1000 units. The cost of interest (*i*) also enters into the equation. Each 1-point increase in the interest rate raises costs by $3000. Write
- the new cost equation.

Chapter 8 Exercise 8

- A competitive firm has the following short-run cost function: $C(q) = q^3 - 8q^2 + 30q + 5$.
- **a.** Find MC, AC, and AVC and sketch them on a graph.
- **b.** At what range of prices will the firm supply zero output?
- **c.** Identify the firm's supply curve on your graph.
- **d.** At what price would the firm supply exactly 6 units of output?