Microeconomic Analysis - Problem Set #6

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Concepts and Critical Thinking

Please answer the following questions briefly (1-5 sentences). Use examples as necessary. Be sure to label graphs fully, if appropriate.

1. What is the difference between accounting profit and economic profit? Is it possible for a firm to be profitable in an accounting sense but not an economic sense? Is it possible for a firm to be profitable in an economic sense but not an accounting sense?

2. Explain "economic profit," "economic rent," and "producer surplus." Where does each come from?

3. In a competitive industry, with identical firms (e.g. no economic rents), why are profits normal (zero) in the long run?

4. In a competitive industry, even among firms with significant cost differences (e.g. economic rents), why do profits tend to return to normal (0) in the long run?

5. For each industry below, indicate:

    1. Whether it is likely to be an increasing cost, decreasing cost, or constant cost industry

    2. Describe would would happen to the long run equilibrium price and output for the industry from an *increase* in industry-wide demand

    3. Graph this series of changes, indicating the long run industry supply curve (no need to draw graphs for individual firms).

(a) Software distribution

(b) Manufacturing pencils

(c) Gold mining

Quantitative Applications

Show all work for calculations–you may lose points, even if correct, for missing work. Be sure to label graphs fully, if appropriate.

6. Frame de Art is an art framing shop in a small town. Frame de Art has one storefront (with a rent of \$500/week), and can hire workers for \$300/week per worker. The table below shows how output of framed art (in 100s/week) varies with the number of workers. Assuming labor is the only variable cost, make a table to calculate the average cost and marginal cost of 0, 1, 2, 3, 4, and 5 (hundred) framing jobs.

Framed Art (100s/week) q	Labor l
0	0
1	1
2	3
3	6
4	11
5	20

7. Mike's Bikes produces racing bicycles. Consider the following graph, which illustrates the short run average total cost curves corresponding to three possible plant sizes Mike could produce with: a small plant, a medium plant, and a large plant.
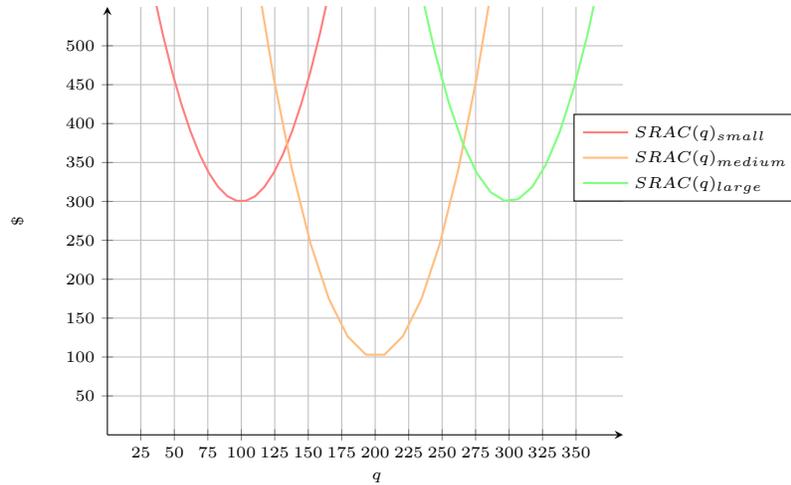
(a) If Mike wanted to produce 125 bikes, what size plant should be used, and why? What about 150 bikes?

(b) If Mike wanted to produce 150 bikes, what size plant should be used, and why? What about 275 bikes?

(c) Draw the long run average cost curve on the graph provided (or sketch one yourself).

(d) Suppose Mike's long run total cost function can be roughly expressed as:

$$LRC(q) = \frac{1}{64}q^3 - 6.25q^2 + 725q$$

with a long run marginal cost function of

$$LRMC(q) = \frac{3}{64}q^2 - 12.5q + 725$$

Find the quantity of bikes where long run average cost is minimized. Plot this point on your graph. At what range of production does Mike experience economies of scale? At what range of production does Mike experience diseconomies of scale?

(e) What is the minimum average cost of producing bikes in the long run?

8. Daniel's Midland Archers has the following total cost function for producing archery bows:
$$C(q) = 2q^2 + 3q + 50$$
and a marginal cost of
$$MC(q) = 4q + 3$$

(a) Write an expression for fixed costs.

(b) Write an expression for variable costs.

(c) Write an expression for average variable costs.

(d) Write an expression for average fixed costs.

(e) Write an expression for average (total) costs.

(f) At what price does Daniel's Midland Archers break even?

(g) Below what price would Daniel's Midland Archers shut down in the short-run?

(h) Write an equation for the firm's short-run inverse supply curve, and sketch a rough graph.

(i) What differences would there be between how Daniel's Midland Archers decides to produce in the short run versus the long run?

(j) In the long run, with many identical sellers of archery bows, what would be the equilibrium price?

9. Assume that consumers view tax preparation services as undifferentiated among producers, and that there are hundreds of companies offering tax preparation in a given market. The current market equilibrium price is $120. Joe Audit's Tax Service has a daily short-run total cost given by

$$C(q) = 100 + 4q^2$$

with a marginal cost of

$$MC(q) = 8q$$

(a) How many tax returns should Joe prepare each day if his goal is to maximize profits?

(b) How much profit will he earn each day?

(c) At what market price would Joe break even?

(d) Below what hypothetical price would Joe shut down in the short run?