

Econ_101_Spring 2007_IVY Tech College
Homework 05:Chapter 05: Solutions

1. In the following table, provide the numbers for marginal cost. Then use the data to draw the short-run supply curve for tables.

| Tables per hour | Total cost | Marginal cost |
|-----------------|------------|---------------|
| 3 | 120 | -- |
| 4 | 155 | 35 |
| 5 | 200 | 45 |
| 6 | 270 | 70 |

The supply curve is the marginal cost curve (above the shut-down price, which cannot be calculated from this table).

2. The following table shows short-run marginal costs for a perfectly competitive firm:

| | | | | | |
|---------------|-----|------|------|------|------|
| Output | 100 | 200 | 300 | 400 | 500 |
| Marginal cost | \$5 | \$10 | \$20 | \$40 | \$70 |

- a. Use this information to draw the firm's marginal cost curve.
 b. Suppose the shut-down price is \$10. Draw the firm's short-run supply curve.
The supply curve is the marginal cost curve, beginning at \$10.
 c. Suppose there are 100 identical firms with the same marginal cost curve. Draw the short-run industry supply curve.

| | | | | | |
|---------------|------------|---------------|---------------|---------------|---------------|
| Price | \$5 | \$10 | \$20 | \$40 | \$70 |
| Output | 0 | 20,000 | 30,000 | 40,000 | 50,000 |

3. You've been hired by an unprofitable firm to determine whether it should shut down its unprofitable operation. The firm currently uses 70 workers to produce 300 units of output per day. The daily wage (per worker) is \$100, and the price of the firm's output is \$30. The cost of other variable inputs is \$500 per day. Although you don't know the firm's fixed cost, you know that it is high enough that the firm's total costs exceed its total revenue. Should the firm continue to operate at a loss?

If the firm continues to operate its facility, its total revenue will be \$9,000 = \$30 times 300 units of output. This is the benefit of operating the facility. The cost of operating the facility is the variable cost, which equals the sum of labor costs (\$7,000 = the \$100 wage times 70 workers) and the cost of other variable inputs (\$500). Total revenue exceeds variable cost, so it is sensible to continue operating the facility in the short run, even though it is losing money.

9. Suppose each lamp manufacturer produces 10 lamps per hour. In the following table, fill in a number wherever you see a _____. Then use the data in the table to draw the long-run supply curve for lamps.

| Number of Firms | Industry Output | Total Cost for Typical Firm | Average Cost per Lamp |
|-----------------|-----------------|-----------------------------|-----------------------|
| 40 | <u>400</u> | \$300 | \$ <u>30</u> |
| 80 | <u>800</u> | \$360 | \$ <u>36</u> |
| 120 | <u>1200</u> | \$420 | \$ <u>42</u> |

Long-run supply curve:

| Price | Output |
|-------------|-------------|
| \$30 | 400 |
| \$36 | 800 |
| \$42 | 1200 |

10. Suppose that a new technology decreases the amount of labor time required to produce a particular good. Would you expect all firms eventually to adopt the new technology?

Yes. The new technology reduces costs, and because in a perfectly-competitive industry, firms just break even in the long run, any firm that does not adopt the new technology will lose money and thus exit the industry.