CHAPTER 7: SECTION 2

Costs

Five types of costs are associated with the production of goods: fixed cost, variable cost, total cost, average total cost, and marginal cost.
Fixed Cost, Variable Cost and Total Cost

- A **fixed cost** is a cost, or expense, that is the same no matter how many units of a good are produced. An example is **building rent**.

- A **variable cost** changes with the number of units of a good produced.

- **Total cost** is the **sum** of fixed cost plus variable cost: Total cost = Fixed cost + Variable cost.
Average Total Cost

To determine how much you need to charge in order to make a profit, it helps to understand the concept of average total cost. The average total cost is the total cost divided by the quantity of output: Average total cost = Total cost $\div$ Quantity.
Marginal Cost

- One concept is very important when deciding how much of a good to make—marginal cost.

- **Marginal cost** is the cost of producing an additional unit of a good—that is, the change in total cost that results from producing an additional unit of output.
A perfect example of marginal cost involves airline travel.

Example: A plane is preparing to depart from the gate. A few empty seats remain, for which the airline is charging $400.

Question: What is the additional cost to the airline if one more passenger boards the plane?

Consider: Additional cost of pilots, attendants, food, and fuel.

Simply adding one more passenger will not increase the number of pilots or flight attendants and will not significantly affect the amount of gas needed. The marginal cost of adding one more passenger is close to $0.
<table>
<thead>
<tr>
<th>Type of cost</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost (FC)</td>
<td>Cost, or expense, that does not change as output changes</td>
<td>A firm's monthly rent is a fixed cost.</td>
</tr>
<tr>
<td>Variable cost (VC)</td>
<td>Cost, or expense, that changes as output changes</td>
<td>The amount a firm spends on employees' wages is usually a variable cost.</td>
</tr>
<tr>
<td>Total cost (TC)</td>
<td>Fixed costs plus variable costs (FC + VC)</td>
<td>If fixed costs equal $2,000, and variable costs equal $4,000, then total cost equals $6,000.</td>
</tr>
<tr>
<td>Average total cost (ATC)</td>
<td>Total cost divided by quantity of output ( \frac{TC}{Q} )</td>
<td>If total cost equals $6,000, and quantity equals 1,000 units, then average total cost equals $6.</td>
</tr>
<tr>
<td>Marginal cost (MC)</td>
<td>Change in total cost divided by change in quantity of output ( \frac{\triangle TC}{\triangle Q} )</td>
<td>If total cost equals $6,000 when quantity equals 1,000 units, and total cost equals $6,008 when quantity equals 1,001 units, then marginal cost equals $8.</td>
</tr>
</tbody>
</table>
CHAPTER 7: SECTION 3

Revenue and Its Applications
Total Revenue and Marginal Revenue

- **Total revenue** is defined as the *price* of a good times the *quantity* sold.

- **Marginal revenue** is defined as the revenue from selling an *additional* unit of a good—that is, the change in total revenue that results from selling an additional unit of output.

Firms Have to Answer Questions

- How much should we produce?
- What price should we charge?
How Much Will a Firm Produce?

- A firm should continue to produce as long as marginal revenue is greater than marginal cost (MR > MC). In fact, some economists think that a firm should continue to produce additional units until marginal revenue is equal to marginal cost.

What Every Firm Wants: To Maximize Profit

- Maximizing profit is the same as getting the largest possible difference between total revenue and total cost. (Profit is the difference between total revenue and total cost.)
Computing Profit or Loss

A firm computes its profits and losses using three formulas.

- Total cost = Fixed cost + Variable cost.
- Total revenue = Price x Quantity of good sold.
- Profit (or loss) = Total revenue - Total cost.
The Law of Diminishing Returns

- The law of diminishing returns states that if additional units of one resource are added to another resource in fixed supply, eventually the additional output will decrease.

- Suppose a firm wants to add workers. As long as the additional output produced by the additional workers multiplied by the selling price of the good is greater than the wage paid to the workers, it is a good idea to hire the additional employees.

<table>
<thead>
<tr>
<th>(1) Workers</th>
<th>(2) Quantity of output produced each day</th>
<th>(3) Additional output produced (each day) as a result of hiring an additional worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0 units</td>
<td>0 units</td>
</tr>
<tr>
<td>1</td>
<td>5 units</td>
<td>5 units (5 - 0 = 5)</td>
</tr>
<tr>
<td>2</td>
<td>11 units</td>
<td>6 units (11 - 5 = 6)</td>
</tr>
<tr>
<td>3</td>
<td>18 units</td>
<td>7 units (18 - 11 = 7)</td>
</tr>
<tr>
<td>4</td>
<td>23 units</td>
<td>5 units (23 - 18 = 5)</td>
</tr>
<tr>
<td>5</td>
<td>26 units</td>
<td>3 units (26 - 23 = 3)</td>
</tr>
</tbody>
</table>