

**Chapter 5: Supply
Section 2**

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ECONOMICS

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Objectives

1. **Explain** how firms decide how much labor to hire in order to produce a certain level of output.
2. **Analyze** the production costs of a firm.
3. **Explain** how a firm chooses to set output.
4. **Identify** the factors that a firm must consider before shutting down a profitable business.



Key Terms

- **marginal product of labor:** the change in output from hiring one additional unit of labor
- **increasing marginal returns:** a level of production in which the marginal product of labor increases as the number of workers increases
- **diminishing marginal returns:** a level of production in which the marginal product of labor decreases as the number of workers increases
- **fixed cost:** a cost that does not change, no matter how much of a good is produced



Key Terms, cont.

- **variable cost:** a cost that rises and falls depending on the quantity produced
- **total cost:** the sum of fixed costs plus variable costs
- **marginal cost:** the cost of producing one more unit of a good
- **marginal revenue:** the additional income from selling one more unit of a good
- **average cost:** the total cost divided by the quantity produced
- **operating cost:** the cost of operating a facility



- How can a producer maximize profits?
 - When thinking about how to maximize profits, producers think about the cost involved in producing one more unit of a good.
 - Costs producers take into consideration are:
 - Operating cost
 - Variable cost
 - Total cost
 - Marginal cost



Labor and Output

- All business owners must decide how many workers they will hire.
 - The addition of new workers will increase production until it reaches its peak, at which point, production actually decreases.

Marginal Product of Labor

Labor (number of workers)	Output (beanbags per hour)	Marginal Product of Labor
0	0	—
1	4	4
2	10	6
3	17	7
4	23	6
5	28	5
6	31	3
7	32	1
8	31	-1



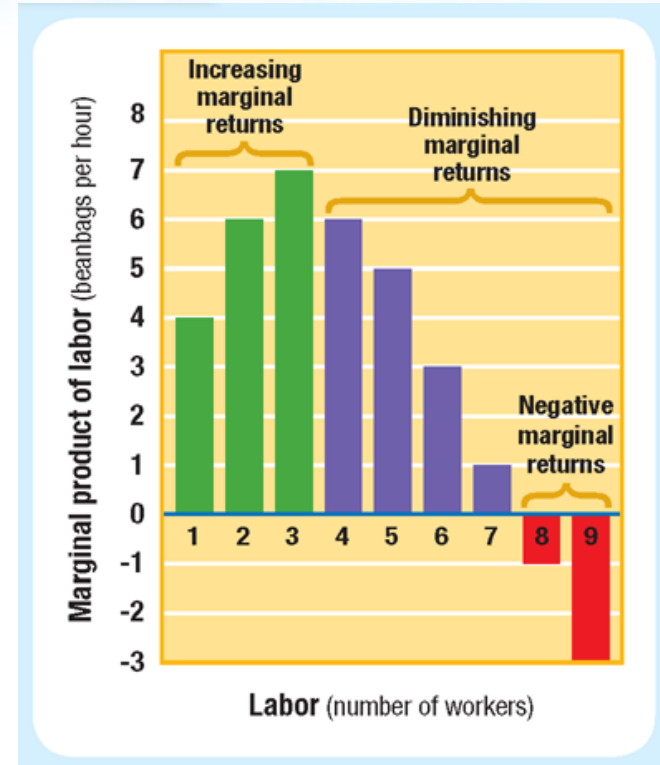
Marginal Returns

- The addition of more workers to a firm allow for a greater amount of specialization.
 - Specialization increases the output and the firm enjoys increasing marginal returns.



Marginal Returns, cont.

- Eventually, though, the benefits of specialization end and the addition of more workers increases total output but at a diminishing rate.
 - A firm with diminishing marginal returns will produce less and less output from each additional unit of labor.



What is the marginal product of labor when the factory employs five workers?



Fixed Costs

- Production costs are divided into two categories - fixed costs and variable costs.
 - Fixed costs mainly involve the production facility and include:
 - Rent
 - Machinery repair
 - Property taxes
 - Worker's salaries



Variable Costs

- Variable costs include:
 - Price of raw materials
 - Some labor
 - Electricity and heating bills
- Fixed costs and variable costs are added together to find the total cost.




Marginal Cost of Production

- Knowing the total cost of several levels of output helps determine the marginal cost of production at each level, or the additional costs of producing one more unit.
- One way to find the best level of output is to figure out where marginal cost is equal to marginal revenue, or the additional income from selling one more unit of a good.



Setting Output

- A firm's primary goal is to maximize profits.
- The firm wants to make the most profit with the least amount of total production cost to the firm.



Beanbags (per hour)	Fixed Cost	Variable Cost	Total Cost (fixed cost + variable cost)	Marginal Cost	Marginal Revenue (market price)	Total Revenue	Profit (total revenue - total cost)
0	\$36	\$0	\$36	—	\$24	\$0	\$-36
1	36	8	44	\$8	24	24	-20
2	36	12	48	4	24	48	0
3	36	15	51	3	24	72	21
4	36	20	56	5	24	96	40
5	36	27	63	7	24	120	57
6	36	36	72	9	24	144	72
7	36	48	84	12	24	168	84
8	36	63	99	15	24	192	93
9	36	82	118	19	24	216	98
10	36	106	142	24	24	240	98
11	36	136	172	30	24	264	92
12	36	173	209	37	24	288	79

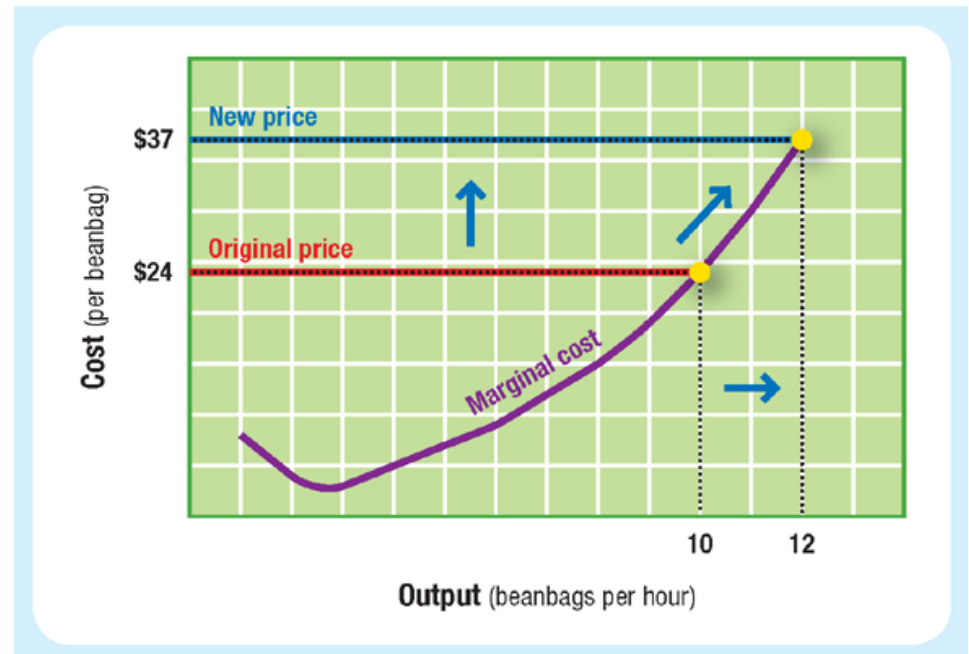
Why is the marginal revenue always equal to \$24?



Determining a Firm's Profit

- The graph to the right shows how a firm's profit per hour can be determined by subtracting total cost from total revenue.

- What would happen to output if market price fell to \$20?
- Why would the firm increase output if the price of a beanbag rose to \$37?



The Shutdown Decision

- What happens to a factory that starts to lose money?
 - Sometimes, even though a factory is producing at its most profitable level, the market price is so low that the factory's total revenue is still less than its total cost.
 - The factory owners have two choices:
 - Continue to produce goods and lose money
 - Shut down the factory



Option 1: Continue to Produce

- Checkpoint: When should a firm keep a money-losing factory open?
 - The firm should keep the factory open if the total revenue from the goods is greater than the cost of keeping the factory open.
 - This would work if the benefit of operating the factory is greater than the variable cost.



Option 2: Shut Down the Factory

- If a firm shuts the factory down it still has to pay all of its fixed costs so it would have money going out but nothing coming in.



- The firm would lose an amount equal to its fixed costs.



Review

- Now that you have learned how a producer can maximize profits, go back and answer the Chapter Essential Question.
 - How do suppliers decide what goods and services to offer?

