PROBLEMS AND APPLICATIONS

1. This chapter discusses many types of costs: opportunity cost, total cost, fixed cost, variable cost, average total cost, and marginal cost. Fill in the type of cost that best completes each sentence:
   a. What you give up for taking some action is called the _____.
   b. _____ is falling when marginal cost is below it and rising when marginal cost is above it.
   c. *A cost that does not depend on the quantity* produced is a _____.
   d. In the ice-cream industry in the short run, _____ includes the cost of cream and sugar but not the cost of the factory.
   e. Profits equal total revenue less _____.
   f. The cost of producing an extra unit of output is the _____.
2. Your aunt is thinking about opening a hardware store. She estimates that it would cost $500,000 per year to rent the location and buy the stock. In addition, she would have to quit her $50,000 per year job as an accountant.
   a. Define *opportunity cost*.
   b. What is your aunt's opportunity cost of running a hardware store for a year? If your aunt thought she could sell $510,000 worth of merchandise in a year, should she open the store? Explain.
3. A commercial fisherman notices the following relationship between hours spent fishing and the quantity of fish caught:

Hours	Quantity of Fish (in pounds)
0 hours	0 lb.
1	10
2	18
3	24
4	28
5	30

   a. What is the marginal product of each hour spent fishing?
   b. Use these data to graph the fisherman's production function. Explain its shape.
   c. The fisherman has a fixed cost of $10 (his pole). The opportunity cost of his time is $5 per hour. Graph the fisherman's total-cost curve. Explain its shape.
4. *Nimbus, Inc., makes brooms and then sells them door-to-door. Here is the relationship between* the number of workers and Nimbus's output in a given day:

Workers	Output	Marginal Product	Total Cost	Average Total Cost	Marginal Cost
0	0	—	—		
		—			—
1	20		—	—	
		—			—
2	50		—	—	
		—			—
3	90		—	—	
		—			—
4	120		—	—	
		—			—
5	140		—	—	
		—			—
6	150		—	—	
		—			—
7	155		—	—	

   a. Fill in the column of marginal products. What pattern do you see? How might you explain it?
   b. A worker costs $100 a day, and the firm has fixed costs of $200. Use this information to fill in the column for total cost.
   c. Fill in the column for average total cost. (Recall that $ATC = TC/Q$.) What pattern do you see?