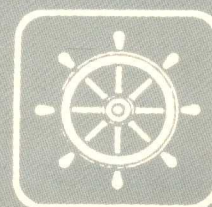
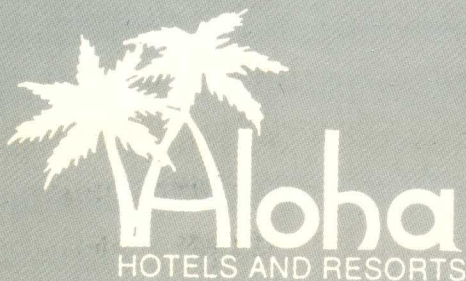
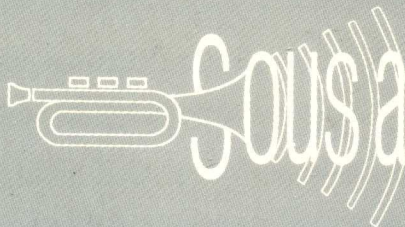
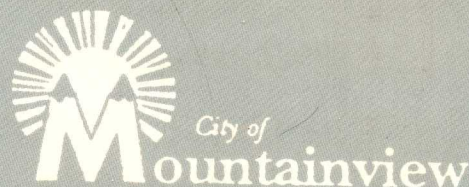
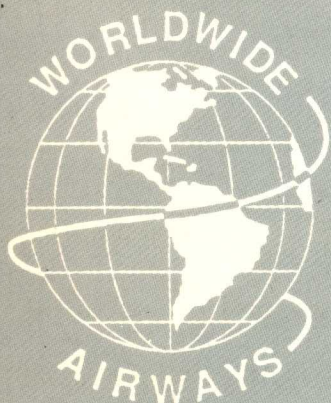


*Solutions Manual, Chapters 1–12  
to Accompany*



# *Managerial Accounting*

*Ronald W. Hilton*





**SOLUTIONS MANUAL  
CHAPTERS 1-12  
TO ACCOMPANY**

# **MANAGERIAL ACCOUNTING**

**RONALD W. HILTON**

*Cornell University*

**McGraw-Hill, Inc.**

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## **Solutions Manual, CHAPTERS 1-12, to Accompany MANAGERIAL ACCOUNTING**

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## Preface

The best way for most students to learn managerial accounting is to read the text and then solve a representative sample of the review questions, exercises, problems, and cases at the end of each chapter. These end-of-chapter materials span a wide range of topics, types of organizations, and levels of difficulty. The topic of each exercise, problem, and case is indicated in the text. The estimated amount of time required is shown in the Solutions Manual. Also available to instructors is the Instructor's Manual, which contains a variety of helpful materials for designing and teaching a managerial accounting course. Included in the Instructor's Manual is a table indicating the level of difficulty of each exercise, problem, and case. Also included in the manual are sample assignments, demonstration problems, tips for new teachers, a chapter conversion chart, transparency masters, learning objectives, chapter overviews, and a discussion of key lecture concepts for each chapter.

Ronald W. Hilton



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# Contents

Preface	v
<b>Chapter 1 Managerial Accounting: An Overview</b>	<b>1</b>
Answers to Review Questions	1
Solutions to Exercises	4
Solutions to Problems	4
<b>Chapter 2 Basic Cost Terms and Concepts</b>	<b>7</b>
Answers to Review Questions	7
Solutions to Exercises	9
Solutions to Problems	12
Solution to Case	21
<b>Chapter 3 Job-Order Costing Systems</b>	<b>23</b>
Answers to Review Questions	23
Solutions to Exercises	25
Solutions to Problems	32
Solution to Case	51
<b>Chapter 4 Process Costing and Hybrid Product-Costing Systems</b>	<b>53</b>
Answers to Review Questions	53
Solutions to Exercises	55
Solutions to Problems	65
Solution to Case	84
<b>Chapter 5 Cost Management Systems for the New Manufacturing Environment</b>	<b>87</b>
Answers to Review Questions	87
Solutions to Exercises	90
Solutions to Problems	95
Solution to Case	119
<b>Chapter 6 Cost Behavior and Estimation</b>	<b>123</b>
Answers to Review Questions	123
Solutions to Exercises	127
Solutions to Problems	141
Solution to Case	156
<b>Chapter 7 Cost-Volume-Profit Analysis</b>	<b>157</b>
Answers to Review Questions	157
Solutions to Exercises	159
Solutions to Problems	166
Solutions to Cases	184

<b>Chapter 8</b>	<b>Budgeting: Profit Planning and Control Systems</b>	<b>187</b>
	Answers to Review Questions	187
	Solutions to Exercises	190
	Solutions to Problems	197
	Solution to Case	212
<b>Chapter 9</b>	<b>Control through Standard-Costing Systems</b>	<b>213</b>
	Answers to Review Questions	213
	Solutions to Exercises	215
	Solutions to Problems	223
	Solution to Case	240
<b>Chapter 10</b>	<b>Flexible Budgets and Control of Overhead Costs</b>	<b>241</b>
	Answers to Review Questions	241
	Solutions to Exercises	244
	Solutions to Problems	252
	Solution to Case	277
<b>Chapter 11</b>	<b>Responsibility Accounting, Cost Allocation, and Income Reporting</b>	<b>279</b>
	Answers to Review Questions	279
	Solutions to Exercises	282
	Solutions to Problems	288
	Solution to Case	306
<b>Chapter 12</b>	<b>Investment Centers and Transfer Pricing</b>	<b>307</b>
	Answers to Review Questions	307
	Solutions to Exercises	309
	Solutions to Problems	313
	Solutions to Cases	326



## Managerial Accounting: An Overview

### ANSWERS TO REVIEW QUESTIONS

**1-1** Plausible goals for the organizations listed are as follows:

- (a) American Red Cross: (1) To raise funds from the general public sufficient to have resources available to meet any disaster that may occur, and (2) to provide assistance to people who are victims of a disaster anywhere in the country on short notice.
- (b) General Motors: (1) To earn income sufficient to provide a good return on the investment of the company's stockholders, and (2) to provide the highest quality product possible.
- (c) JC Penney: (1) To penetrate the retail market in virtually every location in the United States, and (2) to grow over time in terms of number of retail locations, total assets, and earnings.
- (d) City of Pittsburgh: (1) To maintain an urban environment as free of pollution as possible, and (2) to provide life safety, police, and fire protection to the city's citizens.
- (e) Hertz: (1) To be a recognizable household name associated with rental car services, and (2) to provide reliable and economical transportation services to the company's customers.

**1-2** The four basic management activities are listed and defined as follows:

- (a) Decision making: Choosing among the available alternatives.
- (b) Planning: Developing a detailed financial and operational description of anticipated operations.
- (c) Directing operations: Running the organization on a day-to-day basis.
- (d) Controlling: Ensuring that the organization operates in the intended manner and achieves its goals.

**1-3** Examples of the four primary management activities in the context of a national fast-food chain, such as McDonald's or Pizza Hut, are as follows:

- (a) Decision making: Choosing among several possible locations for a new fast-food outlet.
- (b) Planning: Developing a cost budget for the food and paper products to be used during the next quarter in a particular fast-food restaurant.
- (c) Directing operations: Developing detailed schedules for personnel for the next month to provide counter service in a particular fast-food restaurant.
- (d) Controlling: Comparing the actual cost of paper products used during a particular month in a restaurant with the anticipated cost of paper products for that same time period.

**1-4** Examples of the objectives of managerial accounting activity in an airline company are described below:

- (a) Providing managers with information for decision making and planning: Managerial accountants provide estimates of the cost of adding a flight on the New York to Miami route.
- (b) Assisting managers in directing and controlling operations: Managerial accountants provide information about the actual costs of flying the routes in the airline's northeastern geographical sector during a particular month.

- (c) Motivating managers toward the organization's goals: A budget is provided for the cost of handling baggage at O'Hare Airport in Chicago. The budget is given to the airline's baggage handling manager, who is expected to strive to achieve the budget.
  - (d) Measuring the performance of managers and subunits within the organization: Quarterly income statements are prepared for each of the airline's major geographical sectors, and these income reports are used to evaluate the earnings performance of each sector during the relevant time period.
- 1-5** Four important differences between managerial accounting and financial accounting are listed below:
- (a) Managerial accounting information is provided to managers within the organization, whereas financial accounting information is provided to interested parties outside the organization.
  - (b) Managerial accounting reports are not required and they are unregulated, whereas financial accounting reports are required and must conform to generally accepted accounting principles.
  - (c) The primary source of data for managerial accounting information is the organization's basic accounting system, plus various other sources. These sources include such data as rates of defective products manufactured, physical quantities of material and labor used in production, occupancy rates in hotels and hospitals, and average takeoff delays in airlines. The primary source of data for financial accounting information is almost exclusively the organization's basic accounting system, which accumulates financial information.
  - (d) Managerial accounting reports often focus on subunits within the organization, such as departments, divisions, geographical regions, or product lines. These reports are based on a combination of historical data, estimates, and projections of future events. Financial accounting reports focus on the enterprise in its entirety. These reports are based almost exclusively on historical transaction data.
- 1-6** The cost-accounting system is one part of an organization's overall accounting system, the purpose of which is to accumulate cost information. Cost information accumulated by the cost-accounting system is used for both managerial accounting and financial accounting purposes. Managerial accounting is the broad task of preparing information for decision making, planning, directing, and controlling an organization's operations.
- 1-7** Managers in line positions are directly involved in the provision of services or the production of goods in an organization. Managers in staff positions support the organization's overall objectives, but they are indirectly involved in operations. Examples of line positions in a university are the president, who is the university's chief executive officer, and the provost, who is the university's chief academic officer. Examples of staff positions in a university are the university counsel, who is the university's chief lawyer, and the university's director of maintenance, who is charged with maintaining the university's facilities.
- 1-8** An organization's controller (or comptroller) is the chief managerial and financial accountant. The controller usually is responsible for supervising the personnel in the accounting department and for preparing the information and reports used in both managerial and financial accounting. The treasurer typically is responsible for raising capital and safeguarding the organization's assets. Among the treasurer's responsibilities are management of an organization's investments, its credit policy, and its insurance coverage.
- 1-9** Managerial accounting information often brings to the attention of managers important issues that need their managerial experience and skills. In many cases, managerial accounting information will not answer the question or solve the problem, but rather make management aware that the issue or problem exists. In this sense, managerial accounting sometimes is said to serve an attention-directing role.
- 1-10** Both manufacturing and service-industry firms are engaged in production. The primary difference between these types of companies is that manufacturing firms produce inventoriable goods, whereas the services produced by service-industry firms are not inventoriable. Services, such as air transportation or hotel service, are consumed as they are produced.
- 1-11** (a) In a just-in-time (or JIT) production environment, raw materials and components are purchased or produced just in time to be used at each stage in the production process.



- (b) A computer-integrated manufacturing (CIM) system is the most advanced form of automated manufacturing system, with computers controlling the entire production process.
- (c) A cost-management system is a management planning and control system with the following objectives: to measure the cost of the resources consumed in performing the organization's significant activities; to identify and eliminate non-value-added costs; to determine the efficiency and effectiveness of all major activities; and to identify and evaluate new activities that can improve the future performance of the organization.
- (d) Non-value-added costs are the costs of activities that can be eliminated with no deterioration of product quality, performance, or perceived value.
- (e) A system is an integrated structure designed to accomplish a stated purpose. A system consists of a set of inputs, a process, and a set of outputs.
- (f) A computer-information system (CIS) is a system consisting of a computer and peripheral devices (hardware), computer programs (software), data, and personnel to operate the system and assist its users.
- (g) A database-management system is general purpose software designed to allow the computer information system to make the most efficient use of its various databases.
- (h) A decision-support system is a computer-based system that is designed to assist managers in making certain types of decisions. A decision-support system includes access to a database, decision methods pertinent to the decisions facing the user, and various ways of displaying the results.

**1-12** CMA stands for Certified Management Accountant. This is the professional certification for managerial accountants established by the Institute of Certified Management Accountants (ICMA), which was established by the National Association of Accountants. The requirements for becoming a CMA include specified educational requirements and successfully passing the CMA examination.

**1-13 (a)** Competence: Ongoing development of knowledge and skills, performance of duties in accordance with relevant laws, regulations, and technical standards, and preparation of complete and clear reports for management.

(b) Confidentiality: Refraining from disclosing, using, or appearing to use confidential information acquired in the course of the managerial accountant's work.

(c) Integrity: Avoidance of conflicts of interest in activities that would prejudice the managerial accountant's ability to carry out his or her duties ethically, and refraining from other activities that would discredit the profession.

(d) Objectivity: Communication of information fairly, objectively, and fully.

**1-14** Managing by the numbers refers to the use of quantitative information for decision making, planning, directing, and controlling operations.

**1-15** Managers rely on many information systems in addition to managerial accounting information. Examples of other information systems include economic analysis and forecasting, marketing research, legal research and analysis, and technical information provided by engineers and production specialists.

**1-16** Managerial accounting and managerial accountants are just as important in nonprofit organizations as they are in profit-seeking enterprises. Managers in nonprofit organizations also need managerial accounting information for decision making, planning, directing, and controlling operations.

**1-17** Becoming the low-cost producer in an industry requires a clear understanding by management of the costs incurred in its production process. Reports and analysis of these costs are a primary function of managerial accounting.

**1-18** A professional is a person engaged in a specified occupation that requires advanced training, skill, and a well-defined body of knowledge. According to this definition from Webster, a managerial accountant is a professional.

## SOLUTIONS TO EXERCISES

### EXERCISE 1-19 (25 minutes)

1. Development of a bonus reward system for managerial personnel is an example of motivating managers toward the organization's goals. To be effective, the bonus system must provide incentives for managers to work toward achieving those goals.
2. Comparison of actual and planned costs is consistent with two objectives of managerial accounting activity: (1) assisting managers in controlling operations, and (2) measuring the performance of managers and subunits within the organization.
3. Determination of manufacturing costs is related to all four objectives of managerial accounting. It is especially closely related to the objective of providing managers with information for decision making and planning.
4. Measurement of inventory costs is most closely associated with the first two objectives of managerial accounting activity: (1) providing managers with information for decision making and planning, and (2) assisting managers in directing and controlling operations. Since inventory costs are also used in external financial reports, they are also relevant to measuring the performance of managers and subunits within the organization.
5. Cost estimation is particularly relevant to the objective of providing managers with information for decision making and planning.
6. Measurement of operating costs is relevant to all four objectives of managerial accounting activity.

### EXERCISE 1-20 (20 minutes)

1. Estimates of any operating costs associated with the proposed luxury cars would be relevant. For example, estimates of the cost of gasoline, routine maintenance, and insurance on the new vehicles would be useful.
2. Data about the cost of maintaining the machine weekly or biweekly would be relevant. In addition, the production manager should consider information about the likely rates of defective products under each maintenance alternative.
3. Estimates of the cost of lost merchandise due to shoplifting and the cost of employing security personnel would be relevant to this decision.
4. Building-cost estimates for the library addition as well as estimated benefits to the population from having the addition would be useful. In estimating the benefits, some value judgments may need to be made about the benefits to the public from having additional library space and more books.

## SOLUTIONS TO PROBLEMS

### PROBLEM 1-21 (30 minutes)

1. Line activities are those primary to the purpose of the organization. They are the activities that create and distribute the goods and services of the organization. Line reporting refers to the reporting relationship between different hierarchical management levels in line activities (e.g., the reporting relationship between the general supervisor and the plant manager).

Staff activities are services provided by departments in the organization in support of its line activities. The role of the division controller in the division is an example of a staff activity. The reporting relationship between the division controller and the division manager is an example of a staff reporting relationship.



2. a. The division controller is responsible to both the corporate controller and the division manager. The corporate controller assigns the division controller to the division and has final responsibility for promotion and salary. Thus, the division controller is an employee of the controller's department and reports to the corporate controller. At the same time, the division controller also serves as a staff resource to the division manager. The division controller is required to file an independent commentary on the division's financial results, which could well differ from the division manager's commentary.

The division manager does evaluate the division controller's performance and makes salary and promotion recommendations.

- b. The motivation of the division controller would be affected by this dual reporting relationship. The division controller is being evaluated by two people whose responsibilities are not always congruent. What may be considered good performance by one person may be considered unsatisfactory by the other. Thus, the division controller will have difficulty knowing what factors influence his or her progress in the company. The circumstances described in the problem do not provide positive motivation for the division controller.

#### PROBLEM 1-22 (45 minutes)

1. Allen's considerations are determined largely by her position as an accountant, with responsibilities to FulRange Inc., others in the company, and herself. Allen's job involves collecting, analyzing, and reporting operating information. Although not responsible for product quality, Allen should exercise initiative and good judgment in providing management with information having a potentially adverse economic impact.

Allen should determine whether the controller's request violates her professional or personal standards or the company's code of ethics, should FulRange have such a code. As Allen decides how to proceed, she should protect proprietary information and should not violate the "chain of command" by discussing this matter with the controller's superiors.

2. a. The controller has reporting responsibilities and should protect the overall company interests by encouraging further study of the problem by those in his or her department, by informing superiors in this matter, and by working with others in the company to find solutions.
- b. The quality control engineer has responsibilities for product quality and should protect overall company interests by continuing to study the quality of reworked rejects, informing the plant manager and his staff in this matter, and working with others in the company to find solutions.
- c. The plant manager and his staff have responsibilities for product quality and cost and should protect overall company interests by exercising the stewardship expected of them. Plant management should be sure that products meet quality standards. Absentee owners need information from management, and the plant manager and his staff have a responsibility to inform the board of directors elected by the owners of any problems that could affect the well-being of FulRange.
3. Allen needs to protect the interests of FulRange, others in the company, and herself. Allen is vulnerable if she conceals the problem and it eventually surfaces. Allen must take some action to reduce her vulnerability. One possible action that Allen could take would be to obey the controller and prepare the advance material for the board without mentioning or highlighting the probable failure of reworks. Because this differs from the long-standing practice of highlighting information with potentially adverse economic impact, Allen should write a report to the controller detailing the probable failure of reworks, the analysis made by her and the quality control engineer, and the controller's instructions in this matter.

**PROBLEM 1-23 (25 minutes)**

The intent of a code of professional ethics should be to provide management accountants with assistance in determining acceptable behavior in the performance of their duties. A code of professional ethics would demonstrate top management's commitment to ethical behavior, provide guidelines for the appropriate conduct of company business, provide guidelines against which management accountants could evaluate the propriety of their actions taken under their own initiative and at the request of others, and specify the company's expectations regarding the integrity of its external and internal reports.

Benefits the company should be expected to gain from the implementation of a code of professional ethics for the management accountant include: (1) assurances that management accountants will perform their responsibilities with the high level of integrity expected of them; (2) potential inappropriate or illegal actions will be called to management's attention on a timely basis; and (3) internal and external reports will be prepared properly.



## Basic Cost Terms and Concepts

### ANSWERS TO REVIEW QUESTIONS

- 2-1** The phrase “different costs for different purposes” refers to the fact that the word “cost” can have different meanings depending on the context in which it is used. Cost data that are classified and recorded in a particular way for one purpose may be inappropriate for another use.
- 2-2** The City of Los Angeles would use cost information for planning when it develops a budget for its operations during the next year. Included in that budget would be projected costs for police and fire protection, street maintenance, and city administration. At the end of the year this budget would be used for cost control by comparing the actual costs incurred with projected costs in the budget. City administrators would also use cost data in making decisions, such as where to locate a new fire station.
- 2-3** Fixed costs remain constant in total across changes in activity, whereas variable costs change in proportion to the level of activity.
- 2-4** The fixed cost per unit declines as the level of activity (or cost driver) increases. This reduction in the cost per unit occurs because the total fixed cost, which does not change as activity changes, is spread over a larger number of activity units.
- 2-5** The variable cost per unit remains constant as the level of activity (or cost driver) changes. Variable costs change in total in proportion to activity, and the additional variable cost when one unit of activity is added is the variable cost per unit.
- 2-6** Examples of direct costs of the Food and Beverage Department in a hotel include the food and beverages served, the wages of table service personnel, and the costs of entertainment in the dining room and lounge. Examples of indirect costs of the Food and Beverage Department include allocated costs of advertising for the entire hotel, allocated costs of the Grounds and Maintenance Department, and an allocation of the hotel general manager’s salary.
- 2-7** Costs that are likely to be controllable by a city’s airport manager include the wages of personnel hired by and under the direction of the airport manager, the cost of heat and light in the airport manager’s administrative offices, and the cost of some materials consumed in the process of operating the airport, such as cleaning, painting, and maintenance materials. Costs that are likely to be uncontrollable by the city’s airport manager include depreciation of the airport facilities, fees paid by the airport to the federal government for air traffic control services, and insurance coverage for the airport employees and patrons.
- 2-8** The cost of idle time is treated as manufacturing overhead, because it is a normal cost of the manufacturing operation that should be spread out among all of the manufactured products. The alternative to this treatment would be to charge the cost of idle time to a particular job that happens to be in process when the idle time occurs. Idle time often results from a random event, such as a power outage. It would overstate the cost of the job that happened to be in process if the cost of idle time resulting from such a random event were charged only to that job.
- 2-9** Overtime premium is included in manufacturing overhead in order to spread the extra cost of the overtime over all of the products produced, since overtime often is a normal cost of the manufacturing operation. The alternative would be to charge the overtime premium to the particular job worked on during overtime. In most cases, such treatment would overstate the cost of that job, since it is only coincidental that a particular job happened to be done on overtime. The need for overtime to complete a particular job results from the fact that other jobs were completed during regular hours.

- 2-10** (a) Merchandise costs: The cost of purchasing household appliances in a Sears store and the cost of transportation in acquiring hardware to sell in a Wal-Mart store.
- (b) Selling costs: The cost of national advertising by Pizza Hut and the cost of special sales promotions at Radio Shack.
- (c) Distribution costs: The costs incurred by McDonald's Corporation in transporting its meat and paper products to its various regional distribution centers and ultimately to its individual restaurants, and the cost incurred by Mobil in transporting gasoline to its service stations.
- (d) Administrative costs: The salaries of top administrators of the American Cancer Society and the salary of the executive secretary serving the president of your university.
- (e) Research and development costs: The salaries of engineers at Chrysler, and the cost of materials used in a NASA research laboratory.
- 2-11** Product costs are costs that are associated with manufactured goods until the time period during which the products are sold, when the product costs become expenses. Period costs are those that are expensed during the time period in which they are incurred.
- 2-12** The most important difference between a manufacturing firm and a service industry firm, with regard to the classification of costs, is that the goods produced by a manufacturing firm are inventoried, whereas the services produced by a service industry firm are consumed as they are produced. This means that the costs incurred in manufacturing products are treated as product costs until the period during which the goods are sold. Most of the costs incurred in a service industry firm to produce services are operating expenses that are treated as period costs.
- 2-13** Product costs are also called inventoriable costs, because they are assigned to manufactured goods that are inventoried until a later period, when the products are sold. The product costs remain in the Finished-Goods Inventory account until the time period when the goods are sold.
- 2-14** Out-of-pocket costs are costs paid in cash at or near the time they are incurred. An opportunity cost is the potential benefit given up when the choice of one action precludes the selection of a different action.
- 2-15** A sunk cost is a cost that was incurred in the past and cannot be altered by any current or future decision. A differential cost is the difference in a cost item under two decision alternatives. Information overload is the provision of so much information that, due to human limitations in processing information, managers cannot effectively use it.
- 2-16** A marginal cost is the extra cost incurred in producing one additional unit of output. The average cost is the total cost of producing a particular quantity of product or services, divided by the number of units of product or service produced.
- 2-17** The process of registering for classes varies widely among colleges and universities, and the responses to this question will vary as well. Examples of information that might be useful include the credit requirements and course requirements to obtain a particular degree, and a list of the prerequisites for each of the elective courses in a particular major. Such information could help the student plan his or her academic program over several semesters or quarters. An example of information that might create information overload would be a comprehensive listing of every course offered by the college in the past five years.
- 2-18** The purchase cost of the old cash registers is a sunk cost, since it occurred in the past and cannot be changed by any future course of action. The manager is exhibiting a common behavioral tendency to pay too much attention to sunk costs.
- 2-19** (a) Direct cost
- (b) Direct cost
- (c) Indirect cost
- (d) Indirect cost
- 2-20** (a) Uncontrollable cost
- (b) Controllable cost
- (c) Uncontrollable cost

## SOLUTIONS TO EXERCISES

### EXERCISE 2-21 (10 minutes)

The general formula for solving all three cases is as follows:

$$\begin{array}{|c|} \hline \text{Beginning} \\ \text{inventory of} \\ \text{finished} \\ \text{goods} \\ \hline \end{array} + \begin{array}{|c|} \hline \text{Cost of goods} \\ \text{manufactured} \\ \text{during period} \\ \hline \end{array} - \begin{array}{|c|} \hline \text{Ending} \\ \text{inventory} \\ \text{of finished} \\ \text{goods} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Cost-of-goods-} \\ \text{sold} \\ \text{expense} \\ \hline \end{array}$$

Using this formula, we can find the missing amounts as follows:

	Case		
	I	II	III
Beginning inventory of finished goods .....	\$10,000	\$ 75,000*	\$ 5,000
Add: Cost of goods manufactured .....	95,000	428,000	320,000*
Subtract: Ending inventory of finished goods .....	8,000	98,000	21,000
Cost of goods sold .....	<u>\$97,000*</u>	<u>\$405,000</u>	<u>\$304,000</u>

\*Amount missing in exercise.

### EXERCISE 2-22 (10 minutes)

1. Hours worked .....	40
Wage rate .....	× \$17
Total compensation .....	<u>\$680</u>
2. Classification:	
Direct labor (36 hours × \$17) .....	\$612
Overhead (idle time: 4 hours × \$17) .....	68
Total compensation .....	<u>\$680</u>

### EXERCISE 2-23 (10 minutes)

1. Regular wages (40 hours × \$14) .....	\$560
Overtime wages (5 hours × \$20) .....	100
Total compensation .....	<u>\$660</u>
2. Overtime hours .....	5 hours
Overtime premium per hour (\$20 – \$14) .....	× \$6
Total overtime premium .....	<u>\$30</u>
3. Classification:	
Direct labor (45 hours × \$14) .....	\$630
Overhead (overtime premium: 5 hours × \$6) .....	30
Total compensation .....	<u>\$660</u>



#### EXERCISE 2-24 (10 minutes)

1. Phone bill, January: $\$100 + (\$.25 \times 6,000)$ .....	\$1,600
Phone bill, February: $\$100 + (\$.25 \times 5,000)$ .....	\$1,350
2. Cost per call, January: $\$1,600/6,000$ .....	\$ .267 (rounded)
Cost per call, February: $\$1,350/5,000$ .....	\$ .27
3. Fixed component, January .....	\$ 100
Variable component, January: $\$.25 \times 6,000$ .....	1,500
Total .....	<u>\$1,600</u>

#### EXERCISE 2-25 (5 minutes)

1. Since each phone call costs \$.25, the marginal cost of making the 6,001st call is \$.25.
2. The average cost of a phone call in January (rounded) is \$.267 ( $\$1,600/6,000$ ).

#### EXERCISE 2-26 (5 minutes)

1. The \$12,500 is the *opportunity cost* associated with using the computer in the Department of Education for work in the governor's office.
2. The \$12,500 leasing cost should be assigned to the governor's office. It was incurred as a result of activity in that office.

#### EXERCISE 2-27 (10 minutes)

1. Your decision to see the game really cost you \$75, the amount forgone when you refused to sell the ticket. A convenient way to think about this is as follows: You could have sold the ticket for \$75, thereby resulting in a profit on the deal of \$25 (\$75 sales proceeds minus \$50 out-of-pocket purchase cost). Instead, you went to the game, which left you relieved of your \$50 out-of-pocket cost. The difference between the \$50 *reduction* in your wealth and the \$25 *profit* you could have had is \$75. Thus, \$75 is the true cost of going to the game.
2. The \$75 is an *opportunity cost*. At the time you made the decision to attend the game, the \$50 you actually had paid for the ticket is a *sunk cost*. It is not relevant to any future decision.

#### EXERCISE 2-28 (10 minutes)

Martin Shrood's \$10,000 expenditure is a *sunk cost*. It is irrelevant to any future decision Martin may make about the land.

**EXERCISE 2-29 (5 minutes)**

Annual cost using European component: $\$8,500 \times 10$ .....	<u>\$85,000</u>
Annual cost using Part A200: $(\$4,900 + \$500) \times 10$ .....	<u>54,000</u>
Annual differential cost .....	<u><u>\$31,000</u></u>

**EXERCISE 2-30 (15 minutes)**

1. In most cases, only the cost of the food and beverage consumed by the customer would be a marginal cost. It is unlikely that the restaurant would need to employ additional service personnel, dishwashers, and so on.
2. The marginal cost would include any food and beverages consumed by the passenger and perhaps an imperceptible increase in fuel costs.
3. The marginal cost of a flight would include the aircraft fuel, wages of the flight crew and airport maintenance personnel, and the food and beverages consumed by the passengers and crew.
4. The marginal cost would include the additional wages or commissions earned by the agency employees and the additional electricity used for light, heat, and computer equipment.
5. The marginal cost of the skis would include the direct material. It is unlikely that labor and other costs would change with the addition of only one more product unit.

**EXERCISE 2-31 (15 minutes)**

	Number of Muffler Replacements		
	500	600	700
<b>Total costs:</b>			
Fixed costs .....	(a) \$42,000	\$42,000	(b) \$42,000
Variable costs .....	(c) 25,000	30,000	(d) 35,000
Total costs .....	(e) <u>\$67,000</u>	<u>\$72,000</u>	(f) <u>\$77,000</u>
<b>Cost per muffler replacement:</b>			
Fixed cost .....	(g) \$ 84	(h) \$ 70	(i) \$ 60
Variable cost .....	(j) 50	(k) 50	(l) 50
Total cost per muffler replacement .....	(m) <u>\$134</u>	(n) <u>\$120</u>	(o) <u>\$110</u>

**Explanatory Notes:**

- (a) Fixed costs do not vary with activity.
- (c) Variable cost per replacement =  $\$30,000/60 = \$50$ .  
Total variable cost for 500 replacements =  $\$50 \times 500 = \$25,000$ .
- (g) Fixed cost per replacement =  $\$42,000/500 = \$84$ .
- (j) Variable cost per replacement =  $\$25,000/500 = \$50$ .