

Exercises

■ Exercise 2-24

Cost of Goods Manufactured and Sold; Missing Data

(LO 2-1, 2-3, 2-6)

For each case below, find the missing amount.

	Case I	Case II	Case III
Beginning inventory of finished goods	?	\$12,000	\$ 7,000
Cost of goods manufactured during period	\$419,000	\$95,000	?
Ending inventory of finished goods	98,000	8,000	21,000
Cost of goods sold	405,000	?	304,000

■ Exercise 2-25

Idle Time

(LO 2-5)

A foundry employee worked a normal 40-hour shift, but four hours were idle due to a small fire in the plant. The employee earns \$18 per hour.

Required:

1. Calculate the employee's total compensation for the week.
2. How much of this compensation is a direct-labor cost? How much is overhead?

■ Exercise 2-26

Overtime Cost

(LO 2-5)

A loom operator in a textiles factory earns \$16 per hour. By contract, the employee earns \$24 (time and a half) for overtime hours. The operator worked 45 hours during the first week of May, and overtime is paid after the usual 40 hours.

Required:

1. Compute the loom operator's compensation for the week.
2. Calculate the employee's total overtime premium for the week.
3. How much of the employee's total compensation for the week is direct-labor cost? How much is overhead?

■ Exercise 2-27

Manufacturing Processes; Use of Internet

(LO 2-4)



Not all manufacturing processes fall neatly into the structure presented in the chapter. One variation is called *mass customization*. Search the term mass customization on the Internet.

Required: Select and read several articles about mass customization. Then briefly explain (1) how mass customization relates to the structure of manufacturing processes discussed in the chapter, (2) whether you believe mass customization would be the best type of manufacturing process for a gaming computer manufacturer like *Falcon Northwest*, and (3) what effect this choice would have on *Falcon Northwest's* costs.

■ Exercise 2-28

Cost Classifications

(LO 2-2, 2-8, 2-9)

Consider the following costs that were incurred during the current year:

1. Tire costs incurred by *Ford Motor Company*.
2. Sales commissions paid to the sales force of *Dell Inc.*
3. Wood glue consumed in the manufacture of *Rooms To Go* furniture.
4. Hourly wages of refinery security guards employed by *ExxonMobil*.
5. The salary of a financial vice president of *Hewlett Packard*.
6. Advertising costs of *Coca-Cola*.
7. Straight-line depreciation on factory machinery of *Boeing Corporation*.
8. Wages of assembly-line personnel of *Whirlpool Corporation*.
9. Delivery costs incurred by *Ben & Jerry's* for a shipment of their ice cream to a grocery store.
10. Newsprint consumed in printing *The New York Times*.
11. Plant insurance costs of *Texas Instruments*.
12. LED costs incurred in light-bulb manufacturing of *GE Lighting*.

Required: Evaluate each of the preceding and determine whether the cost is (a) a product cost or a period cost, (b) variable or fixed in terms of behavior, and (c) for the product costs only, whether the cost is properly classified as direct material, direct labor, or manufacturing overhead. Item 1 is done as an example:

1. Tire costs: Product cost, variable, direct material

Alexandria Aluminum Company, a manufacturer of recyclable soda cans, had the following inventory balances at the beginning and end of 20x1.

Inventory Classification	January 1, 20x1	December 31, 20x1
Raw material	\$ 60,000	\$ 70,000
Work in process	120,000	115,000
Finished goods	150,000	165,000

During 20x1, the company purchased \$250,000 of raw material and spent \$400,000 on direct labor. Manufacturing overhead costs were as follows:

Indirect material	\$ 10,000
Indirect labor	25,000
Depreciation on plant and equipment	100,000
Utilities	25,000
Other	30,000

Sales revenue was \$1,105,000 for the year. Selling and administrative expenses for the year amounted to \$110,000. The firm's tax rate is 40 percent.

Required:

1. Prepare a schedule of cost of goods manufactured.
2. Prepare a schedule of cost of goods sold.
3. Prepare an income statement.
4. **Build a spreadsheet:** Construct an Excel spreadsheet to solve all of the preceding requirements. Show how both cost schedules and the income statement will change if the following data change: direct labor is \$390,000 and utilities cost \$35,000.

Exercise 2-29
Schedules of Cost of Goods Manufactured and Sold; Income Statement
(LO 2-1, 2-3, 2-6)

Mighty Muffler, Inc. operates an automobile service facility that specializes in replacing mufflers on compact cars. The following table shows the costs incurred during a month when 600 mufflers were replaced.

	Muffler Replacements		
	500	600	700
Total costs:			
Fixed costs	a	\$42,000	b
Variable costs	c	30,000	d
Total costs	e	\$72,000	f
Cost per muffler replacement:			
Fixed cost	g	h	i
Variable cost	j	k	l
Total cost per muffler replacement	m	n	o

Exercise 2-30
Fixed and Variable Costs; Automobile Service; Missing Data
(LO 2-1, 2-8)

Required: Fill in the missing amounts, labeled (a) through (o), in the table.

A hotel pays the phone company \$100 per month plus \$.25 for each call made. During January 6,000 calls were made. In February 5,000 calls were made.

Required:

1. Calculate the hotel's phone bills for January and February.
2. Calculate the cost per phone call in January and in February.

Exercise 2-31
Fixed, Variable, Marginal, and Average Costs; Hotel
(LO 2-1, 2-8, 2-10)

Exercise 2-32

Economic Characteristics of Costs

(LO 2-1, 2-10)



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Exercise 2-33

Differential Cost

(LO 2-1, 2-10)

Exercise 2-34

Computing Costs; Government Agency

(LO 2-1, 2-9, 2-10)

Exercise 2-35

Economic Characteristics of Costs

(LO 2-1, 2-10)

Exercise 2-36

Marginal Costs

(LO 2-1, 2-10)

3. Separate the January phone bill into its fixed and variable components.
4. What is the marginal cost of one additional phone call in January?
5. What was the average cost of a phone call in January?

Martin Shrood purchased a vacant lot outside of London for £13,500, because he heard that a shopping mall was going to be built on the other side of the road. He figured that he could make a bundle by putting in a fast-food outlet on the site. As it turned out, the rumor was false. A sanitary landfill was located on the other side of the road, and Martin's land was worthless. (£ denotes the British monetary unit, pounds sterling.)*

Required: With respect to the economic characteristics of costs, what type of cost is the £13,500 that Martin paid for the vacant lot?

Orbital Communications, Inc. manufactures communications satellites used in TV signal transmission. The firm currently purchases one component for its satellites from a European firm. An Orbital Communications engineering team has found a way to use the company's own component, part number A200, instead of the European component. However, the Orbital Communications component must be modified at a cost of \$500 per part. The European component costs \$8,900 per part. Orbital Communications' part number A200 costs \$5,100 before it is modified. Orbital Communications currently uses 10 of the European components per year.

Required: Calculate the annual differential cost between Orbital Communications' two production alternatives.

The state Department of Education owns a computer system, which its employees use for word processing and keeping track of education statistics. The governor's office recently began using this computer also. As a result of the increased usage, the demands on the computer soon exceeded its capacity. The director of the Department of Education was soon forced to lease several personal computers to meet the computing needs of her employees. The annual cost of leasing the equipment is \$14,000.

Required:

1. What type of cost is this \$14,000?
2. Should this cost be associated with the governor's office or the Department of Education? Why?

Suppose you paid \$150 for a ticket to see your university's football team compete in a bowl game. Someone offered to buy your ticket for \$400, but you decided to go to the game.

Required:

1. What did it really cost you to see the game?
2. What type of cost is this?

List the costs that would likely be included in each of the following marginal-cost calculations.

1. The marginal cost of one additional passenger on an **American Airlines** flight.
2. The marginal cost of serving one additional customer in a **Chipotle Mexican Grill**.
3. The marginal cost of **United Airlines** adding a flight from Honolulu to Seattle.
4. The marginal cost of keeping a **Wells Fargo** branch bank open one additional hour on Saturdays.
5. The marginal cost of manufacturing one additional **Burton** snowboard.

*Although the euro is used in most European markets, Great Britain still uses the British pound sterling.

Problems

All applicable Problems are available in Connect.



Problem 2-37
Content of Financial Statements and Reports
(LO 2-3, 2-4)

Consider the following cost items:

1. Salaries of players on the **Boston Red Sox**.
2. Year-end completed goods of **Levi Strauss** jeans.
3. Executive compensation costs at **Home Depot**.
4. Advertising costs for **Sony**.
5. Costs incurred during the period to insure a **Ford** plant against fire and flood losses.
6. Current year's depreciation on a **Carnival Cruise Line** ship.
7. The cost of printer ink and paper used during the period by **Shutterfly**.
8. Assembly-line wage cost incurred at a **Kona** bicycle plant.
9. Year-end production in process at **Lenovo** computer manufacturer.
10. The cost of products sold to customers of a **Target** store.
11. The cost of products sold to distributors of carpet manufacturer **Shaw Floors**.

Required:

1. Evaluate the costs just cited, and determine whether the associated dollar amounts would be found on the firm's balance sheet, income statement, or schedule of cost-of-goods-manufactured. (Note: In some cases, more than one answer will apply.)
2. What major asset will normally be insignificant for service enterprises and relatively substantial for retailers, wholesalers, and manufacturers? Briefly discuss.
3. Briefly explain the major differences between income statements of service enterprises versus those of retailers, wholesalers, and manufacturers.

The following selected information was extracted from the 20x1 accounting records of Lone Oak Products:

Raw material purchases	\$ 175,000
Direct labor	254,000
Indirect labor	109,000
Selling and administrative salaries	133,000
Building depreciation*	80,000
Other selling and administrative expenses	195,000
Other factory costs	344,000
Sales revenue (\$130 per unit)	1,495,000

*Seventy-five percent of the company's building was devoted to production activities; the remaining 25 percent was used for selling and administrative functions.

Problem 2-38
Financial Statement Elements: Manufacturer
(LO 2-5, 2-6)

2. Cost of goods manufactured: \$913,200
4. Net income: \$154,420

Inventory data:

	January 1	December 31
Raw material.....	\$ 15,800	\$18,200
Work in process.....	35,700	62,100
Finished goods*	111,100	97,900

*The January 1 and December 31 finished-goods inventory consisted of 1,350 units and 1,190 units, respectively.

Required:

1. Calculate Lone Oak's manufacturing overhead for the year.
2. Calculate Lone Oak's cost of goods manufactured.
3. Compute the company's cost of goods sold.
4. Determine net income for 20x1, assuming a 30% income tax rate.
5. Determine the number of completed units manufactured during the year.
6. **Build a spreadsheet:** Construct an Excel spreadsheet to solve all of the preceding requirements. Show how the solution will change if the following data change: indirect labor is \$115,000 and other factory costs amount to \$516,000.

Problem 2-39

Inventory Estimates; Partial Data

(LO 2-5, 2-6)

Direct material used: \$40,000

On April 12, after the close of business, Singh & Sons had a devastating fire that destroyed the company's work-in-process and finished-goods inventories. Fortunately, all raw materials escaped damage because materials owned by the firm were stored in another warehouse. The following information is available:

Sales revenue through April 12	\$330,000
Income before taxes through April 12	68,000
Direct labor through April 12	120,000
Cost of goods available for sale, April 12	275,000
Work-in-process inventory, January 1	21,000
Finished-goods inventory, January 1	37,000
Gross margin	30% of sales

The firm's accountants determined that the cost of direct materials used normally averages 25 percent of prime costs (i.e., direct material + direct labor). In addition, manufacturing overhead is 50 percent of the firm's total production costs.

Required: Singh & Sons is in the process of negotiating a settlement with its insurance company. Prepare an estimate of the cost of work-in-process and finished-goods inventories that were destroyed by the fire.

Problem 2-40

Financial-Statement Elements; Cost Behavior

(LO 2-5, 2-6, 2-8)

2. Net income: \$168,000

Mason Corporation began operations at the beginning of the current year. One of the company's products, a refrigeration element, sells for \$185 per unit. Information related to the current year's activities follows.

Variable costs per unit:		\$	20
Direct material			37
Direct labor			48
Manufacturing overhead			
Annual fixed costs:		\$600,000	
Manufacturing overhead		860,000	
Selling and administrative			
Production and Sales activity:			24,000
Production (units)			20,000
Sales (units)			

Mason carries its finished-goods inventory at the average unit cost of production and is subject to a 30 percent income tax rate. There was no work in process at year-end.

Required:

1. Determine the cost of the December 31 finished-goods inventory.
2. Compute Mason's net income for the current year ended December 31.
3. If next year's production decreases to 23,000 units and general cost behavior patterns do not change, what is the likely effect on:
 - a. The direct-labor cost of \$37 per unit? Why?
 - b. The fixed manufacturing overhead cost of \$600,000? Why?
 - c. The fixed selling and administrative cost of \$860,000? Why?
 - d. The average unit cost of production? Why?

Problem 2-41

Incomplete Data; Manufacturing Costs

(LO 2-2, 2-5)



This icon indicates that an Excel spreadsheet template is provided on the text's website.

Net income, case A: \$110,000

Determine the missing amounts in each of the following independent cases.

	Case A	Case B	Case C
Beginning inventory, raw material	?	\$20,000	\$15,000
Ending inventory, raw material	\$90,000	?	\$30,000
Purchases of raw material	100,000	85,000	?
Direct material	70,000	95,000	?
Direct labor	?	100,000	125,000
Manufacturing overhead	250,000	?	160,000
Total manufacturing costs	520,000	345,000	340,000

(continued)

	Case A	Case B	Case C
Beginning inventory, work in process	35,000	20,000	?
Ending inventory, work in process	?	35,000	5,000
Cost of goods manufactured	525,000	?	350,000
Beginning inventory, finished goods	50,000	40,000	?
Cost of goods available for sale	?	?	370,000
Ending inventory, finished goods	?	?	25,000
Cost of goods sold	545,000	330,000	?
Sales	?	?	480,000
Gross margin	255,000	170,000	?
Selling and administrative expenses	?	75,000	?
Income before taxes	150,000	?	90,000
Income tax expense	40,000	45,000	?
Net income	?	?	55,000

The following cost data for the year just ended pertain to Sentiments, Inc., a greeting card manufacturer:

Direct material.....	\$2,100,000
Advertising expense.....	99,000
Depreciation on factory building.....	115,000
Direct labor: wages.....	485,000
Cost of finished goods inventory at year-end.....	115,000
Indirect labor: wages.....	140,000
Production supervisor's salary.....	45,000
Service department costs*.....	100,000
Direct labor: fringe benefits.....	95,000
Indirect labor: fringe benefits.....	30,000
Fringe benefits for production supervisor.....	9,000
Total overtime premiums paid.....	55,000
Cost of idle time: production employees [‡]	40,000
Administrative costs.....	150,000
Rental of office space for sales personnel [†]	15,000
Sales commissions.....	5,000
Product promotion costs.....	10,000

*All services are provided to manufacturing departments.

[‡]Cost of idle time is an overhead item; it is not included in the direct-labor wages given above.

[†]The rental of sales space was made necessary when the sales offices were converted to storage space for raw material.

Required:

1. Compute each of the following costs for the year just ended: (a) total prime costs, (b) total manufacturing overhead costs, (c) total conversion costs, (d) total product costs, and (e) total period costs.
2. One of the costs listed above is an opportunity cost. Identify this cost, and explain why it is an opportunity cost.

The following data refer to San Fernando Fashions Company for the year 20x2:

Sales revenue.....	\$950,000
Work-in-process inventory, December 31.....	30,000
Work-in-process inventory, January 1.....	40,000
Selling and administrative expenses.....	150,000
Income tax expense.....	90,000
Purchases of raw material.....	180,000
Raw-material inventory, December 31.....	25,000
Raw-material inventory, January 1.....	40,000
Direct labor.....	200,000

(continued)

Problem 2-42

Cost Terminology
(LO 2-2, 2-5, 2-10)

1(a). Total prime costs: \$2,680,000

1(d). Manufacturing overhead: \$534,000

Problem 2-43

Schedules of Cost of Goods Manufactured and Sold; Income Statement
(LO 2-1, 2-3, 2-5, 2-6)

2. Cost of goods sold: \$580,000

Utilities: plant.....	40,000
Depreciation: plant and equipment.....	60,000
Finished-goods inventory, December 31.....	50,000
Finished-goods inventory, January 1.....	20,000
Indirect material.....	10,000
Indirect labor.....	15,000
Other manufacturing overhead.....	80,000

Required:

1. Prepare San Fernando Fashions' schedule of cost of goods manufactured for the year.
2. Prepare San Fernando Fashions' schedule of cost of goods sold for the year.
3. Prepare San Fernando Fashions' income statement for the year.
4. **Build a spreadsheet:** Construct an Excel spreadsheet to solve all of the preceding requirements. Show how both cost schedules and the income statement will change if raw-material purchases amounted to \$190,000 and indirect labor was \$20,000.

Problem 2-44

Direct and Indirect Labor
(LO 2-1, 2-3, 2-5, 2-9)

2. Total cost of wages: \$624

Highlander Cutlery manufactures kitchen knives. One of the employees, whose job is to cut out wooden knife handles, worked 48 hours during a week in January. The employee earns \$12 per hour for a 40-hour week, and overtime is paid after 40 hours. For additional hours, the employee is paid an overtime rate of \$18 per hour. The employee's time was spent as follows:

Regular duties involving cutting out knife handles.....	38 hours
General shop cleanup duties.....	9 hours
Idle time due to power outage.....	1 hour

Required:

1. Calculate the total cost of the employee's wages during the week described above.
2. Determine the portion of this cost to be classified in each of the following categories:
 - a. Direct labor
 - b. Manufacturing overhead (idle time)
 - c. Manufacturing overhead (overtime premium)
 - d. Manufacturing overhead (indirect labor)

Problem 2-45

Cost Classifications
(LO 2-5, 2-8, 2-9)

Cape Cod Shirt Shop manufactures T-shirts and decorates them with custom designs for retail sale on the premises. Several costs incurred by the company are listed below. For each cost, indicate which of the following classifications best describe the cost. More than one classification may apply to the same cost item.

Cost Classifications

- a. Variable
- b. Fixed
- c. Period
- d. Product
- e. Administrative
- f. Selling
- g. Manufacturing
- h. Research and development
- i. Direct material
- j. Direct labor
- k. Manufacturing overhead

Cost Items

1. Cost of fabric used in T-shirts.
2. Wages of shirtmakers.

3. Cost of new sign in front of retail T-shirt shop.
4. Wages of the employee who repairs the firm's sewing machines.
5. Cost of electricity used in the sewing department.
6. Wages of T-shirt designers and painters.
7. Wages of sales personnel.
8. Depreciation on sewing machines.
9. Rent on the building. Part of the building's first floor is used to make and paint T-shirts. Part of it is used for the retail sales shop. The second floor is used for administrative offices and storage of raw material and finished goods.
10. Cost of daily advertisements in local media.
11. Wages of designers who experiment with new fabrics, paints, and T-shirt designs.
12. Cost of hiring a pilot to fly along the beach pulling a banner advertising the shop.
13. Salary of the owner's secretary.
14. Cost of repairing the gas furnace.
15. Cost of insurance for the production employees.

Heartland Airways operates commuter flights in three Midwestern states. Due to a political convention held in Topeka, the airline added several extra flights during a two-week period. Additional cabin crews were hired on a temporary basis. However, rather than hiring additional flight attendants, the airline used its current attendants on overtime. Monica Gaines worked the following schedule on August 10. All of Gaines's flights on that day were extra flights that the airline would not normally fly.

Regular time: 2 round-trip flights between Topeka and St. Louis (8 hours)
 Overtime: 1 one-way flight from Topeka to Kansas City (3 hours)

Gaines earns \$12 per hour and is paid time and a half when working overtime. Fringe benefits cost the airline \$3 per hour for any hour worked, regardless of whether it is a regular or overtime hour.

Required:

1. Compute the direct cost of compensating Gaines for her services on the flight from Topeka to Kansas City.
2. Compute the cost of Gaines's services that is an indirect cost.
3. How should the cost computed in requirement (2) be treated for cost accounting purposes?
4. Gaines ended her workday on August 10 in Kansas City. However, her next scheduled flight departed Topeka at 11:00 a.m. on August 11. This required Gaines to "dead-head" back to Topeka on an early-morning flight. This means she traveled from Kansas City to Topeka as a passenger, rather than as a working flight attendant. Since the morning flight from Kansas City to Topeka was full, Gaines displaced a paying customer. The revenue lost by the airline was \$82. What type of cost is the \$82? To what flight, if any, is it chargeable? Why?

San Diego Sheet Metal, Inc. incurs a variable cost of \$40 per pound for raw material to produce a special alloy used in manufacturing aircraft.

Required:

1. Draw a graph of the firm's raw material cost, showing the total cost at the following production levels: 10,000 pounds, 20,000 pounds, and 30,000 pounds.
2. Prepare a table that shows the unit cost and total cost of raw material at the following production levels: 1 pound, 10 pounds, and 1,000 pounds.

Hightide Upholstery Company manufactures a special fabric used to upholster the seats in power boats. The company's annual fixed production cost is \$100,000.

Required:

1. Draw a graph of the company's fixed production cost showing the total cost at the following production levels of upholstery fabric: 10,000 yards, 20,000 yards, 30,000 yards, and 40,000 yards.
2. Prepare a table that shows the unit cost and the total cost for the firm's fixed production costs at the following production levels: 1 yard, 10 yards, 10,000 yards, and 40,000 yards.

Problem 2-46

Overtime Premiums and Fringe Benefit Costs; Airline
 (LO 2-1, 2-3, 2-5, 2-9, 2-10)

Problem 2-47

Variable Costs; Graphical and Tabular Analyses
 (LO 2-8, 2-9)

Problem 2-48

Fixed Costs; Graphical and Tabular Analyses
 (LO 2-8, 2-9)