Required:

Materials are added at the beginning of the process. Conversion costs (labor and capital costs) are incurred uniformly. The firm uses the FIFO method of inventory accounting. How many equivalent units of conversion cost were used in the current quarter in Department 100?

P 9–2: IPX Packaging

IPX is a specialized packaging company that packages other manufacturers' products. Other manufacturers ship their products to IPX in bulk. IPX then packages the products using high-speed, state-of-the-art packaging machines and ships the packaged products to wholesalers. A typical order involves packaging small toys in see-through plastic and cardboard containers.

IPX uses a flexible budget to forecast annual plantwide overhead, which is then allocated to jobs based on machine hours. The annual flexible overhead budget is projected to be $6 million of fixed costs and $120 per machine hour. The budgeted number of machine hours for the year is 20,000.

At the end of the year, 21,000 machine hours were used and actual overhead incurred was $9.14 million.

Required:

a. Calculate the overhead rate set at the beginning of the year.

b. Calculate the amount of over/underabsorbed overhead for the year.

c. The company's policy is to write off any over/underabsorbed overhead to cost of goods sold. Will net income rise or fall this year when the over/underabsorbed overhead is written off to cost of goods sold?

P 9–3: Densain Water

The Densain Water plant in Naples, Florida, bottles purified and flavored waters in a variety of sizes (20, 36, 48, and 64 ounces) for sale through vending machines and retail stores. Volume is measured as bottled ounces. The plant's annual budgeted fixed manufacturing overhead amounts to $1.8 million, and variable manufacturing overhead is projected at $0.005 per bottled ounce. Projected volume in the Naples plant next year is 200 million ounces. Actual volume for the year accumulated to 210 million ounces and total manufacturing overhead incurred (both fixed and variable) was $2.85 million.

Required:

a. Calculate the Densian Naples plant overhead rate.

b. How much overhead was absorbed to products in the Naples plant?

c. Calculate the Densian Naples plant's over- or underabsorbed overhead.

d. Describe the effect on income when the over- or underabsorbed overhead calculated in (*c*) is written off to cost of goods sold.

P 9–4: MacGiver Brass

MacGiver Brass is a brass plating firm with sales of $8 million and profits before taxes of $625,000. MacGiver has a loan outstanding at its local bank for working capital purposes. As the loan officer reviewing MacGiver's loan application, you are charged with making a recommendation as to whether the $608,000 loan should be renewed for another year.

Upon reviewing MacGiver's most recent annual report, you find the following footnote:

Underabsorbed overhead of $462,000 was prorated to inventories (⅔) and cost of goods sold (⅓).

P 9–5: Lys

P 9–6: Ware

Required:

a. How should you evaluate MacGiver's annual report in light of this footnote? In particular, how does this footnote affect your recommendation regarding the loan?

b. In preparing for your meeting with MacGiver's president and chief financial officer, what questions do you want to ask regarding this footnote?

P 9–5: Lys Wheels

Lys Wheels manufactures high-performance mountain bikes. Lys uses a predetermined overhead rate based on direct labor hours to absorb overhead to mountain bikes. For the last fiscal year, the firm had the following operating data:

Actual direct labor hours	19,000
Underabsorbed overhead	$ 7,000
Actual overhead incurred	$197,000
Budgeted overhead	$210,000

Required:

What was Lys's budgeted volume last year?

P 9–6: Ware Paper Box

Ware Paper Box manufactures corrugated paper boxes. It uses a job order costing system. Operating data for February and March are as follows:

Job	*Date Started*	*Date Finished*	*Date Sold*	*Total Manufacturing Cost as of 2/28*	*Total Manufacturing Cost in March**
613	1/28	2/5	2/15	$12,500	
614	2/5	2/17	2/20	17,200	
615	2/20	2/27	3/5	18,500	
616	2/25	3/10	3/20	10,100	$13,400
734	2/21	3/15	4/1	4,300	8,200
735	2/27	4/1	4/9	9,100	2,400
736	3/2	3/22	4/19		16,300
617	3/15	3/20	3/26		19,200
618	3/22	4/5	4/15		14,400

*Manufacturing costs incurred only in March. Does not include any manufacturing costs incurred in prior months.

The factory was closed due to a labor strike prior to January 28, when job #613 was started. There were no other jobs in the plant at that time.

Required:

Calculate the following amounts:

a. Work-in-process inventory as of 2/28.

b. Work-in-process inventory as of 3/31.

c. Finished goods inventory as of 2/28.

Required:

a. Calculate Simple Plant's overhead rate for next year.

b. On January 2, the first working day of the new fiscal year, Kusic works eight hours (five hours on manufacturing test strips and three hours waiting for raw materials to arrive). Each day Simple Plant posts all entries (transactions) to the accounts. What are the balances in the Overhead account and the Work-in-Process account at the close of business on January 2?

c. At the end of the year, Kusic's salary and benefits are $50,000, with $44,000 of the total charged to test strips manufactured. Kusic worked 2,000 hours during the year. Property taxes paid during the year amounted to $103,000. What, if any, is the balance in the overhead account before an adjusting entry is made to transfer the balance to other accounts?

P 9–12: Rick's Bags

Rick's Bags manufactures both golf bags and tennis totes. Fixed manufacturing overhead is budgeted to be $187,200, variable manufacturing overhead is budgeted to be $1.10 per direct labor hour, and fixed selling and administration costs are budgeted to be $346,000. Each golf bag is expected to use 2.5 direct labor hours and each tennis tote is expected to use 1.8 direct labor hours. Planned production consists of 12,000 golf bags and 18,000 tennis totes.

During the year, 34,060 direct labor hours are used to make golf bags and 16,250 direct labor hours are used to make tennis totes. Manufacturing overhead incurred during the year was $207,500. Overhead is absorbed into products using actual direct labor hours.

Required:

a. Calculate the manufacturing overhead rate used to absorb overhead to golf bags and tennis totes.

b. A batch of tennis totes is produced in May. The batch uses 1,900 direct labor hours. How much overhead is charged to this batch of tennis totes?

c. Calculate the amount of over/underabsorbed overhead at the end of the year.

d. Describe in nontechnical terms what the over/underabsorbed overhead calculated in part (*c*) means.

P 9–13: Unknown Company

Compute the unknowns:

Sales	$100,000
Direct materials used	29,000
Direct labor	10,000
Variable selling and administration expenses	16,000
Fixed manufacturing overhead	30,000
Fixed selling and administration expenses	9,000
Gross profit	?
Opening material inventory	3,000
Closing material inventory	10,000
Variable manufacturing overhead	?
Purchase of direct material	?
Cost of goods manufactured	?
Net income	1,000

There is no opening or closing finished goods or work-in-process inventory.

9–22: Kitchen Rite

Kitchen Rite is considering outsourcing the production of a steel chassis that is used in a kitchen appliance. Two thousand chassis are produced per month. An outside vendor will supply an identical chassis for $9.90. The chassis is manufactured in two steps. A stamping press punches out the part from sheet metal, bends the sides, and cuts holes in it, all in one operation. Then a welding machine welds the corners. Both the welding and stamping machines are used to produce only this one chassis model. The following job order cost sheet summarizes the costs of producing a single chassis.

	Cost per Unit
Steel plate	$ 4.75
Direct labor:	
Stamping ($20/hour)	1.60
Welding ($30/hour)	2.50
Overhead:	
Stamping (depreciation)	3.60
Welding (lease payment)	2.15
General plant	5.90
	$20.50

The stamping machine is old and has little economic value. A used equipment dealer is willing to remove the machine and haul it away at no cost. The stamping machine was purchased 13 years ago for $1,728,000. For both tax and reporting purposes, it is being depreciated using a 20-year life, straight-line method, and it has zero salvage value. The welding machine is leased for $4,300 per month, and the lease can be canceled at any time and the machine returned. However, an early termination penalty of $1,800 per month for the next 42 months must be paid.

General plant overhead consists primarily of the allocated cost of depreciation on the plant, property taxes, and fire insurance on the plant. Kitchen Rite currently has excess plant space. The manufacturing space freed up if the chassis is outsourced has no other use.

Employees are unionized and have a clause in their contract that prevents the firm from firing them if their jobs are eliminated due to outsourcing. The employees working on the stamping machine will be placed on indefinite furlough at 75 percent of their current pay. The employees operating the welding machine can be reassigned to other positions in the firm as job openings occur. Given the high demand for welders, these reassignments will occur within a few weeks of outsourcing the chassis.

Kitchen Rite has a tax loss for the current and the previous two years.

Required:

Should Kitchen Rite outsource the chassis? Support your recommendation with a clear financial analysis of the facts.

9–23: Frames, Inc.

Frames, Inc., manufactures two types of metal frames: large and small. Steel angle iron is first cut to the appropriate sizes; the pieces are then welded together to form the frames. The process involves a high degree of automation. There is considerable indirect labor by skilled technicians and engineers who maintain the automated equipment. There are two manufacturing departments: cutting and welding. The following report details the actual costs of production for the year:

FRAMES, INC
Year Ending 12/31

Direct Costs

Frame Type	*Units Produced*	*Direct Labor*	*Direct Materials*
Large	10,000	$ 480,000	$950,000
Small	30,000	1,140,000	800,000

Overhead Costs by Department

Overhead Costs	*Cutting*	*Welding*	*Total*
Utilities	$ 58,000	$174,000	$ 232,000
Indirect labor	430,000	480,000	910,000
General factory costs			150,000
Total overhead costs			$1,292,000

Kilowatt-Hours (000s)

Frame Type	*Cutting*	*Welding*	*Total*
Large	530	1,040	1,570
Small	910	1,200	2,110
Total kilowatt-hours	1,440	2,240	3,680

Required:

a. Compute the unit costs of large frames and small frames for the year using a single factorywide overhead rate. The factorywide overhead allocation base is direct labor cost.

b. Compute the unit costs of large frames and small frames for the year using different overhead rates for utilities, indirect labor, and general factory costs. Utility costs and indirect labor costs are allocated to frames using kilowatt-hours. General factory costs are allocated to frames using direct costs (the sum of direct labor and direct materials).

c. Compute the unit costs of large frames and small frames for the year using departmental overhead rates for the cutting and welding departments. General factory overhead costs are evenly divided between the two departments before departmental overhead is allocated to the frames. Cutting department overhead costs are allocated based on direct materials costs; welding department overhead costs are allocated based on kilowatt-hours in the welding department.

d. Analyze why different unit costs result from the different methods of allocating overhead costs to the products. Which method is best?

P 9–24: Hurst Mats

Hurst Mats manufactures custom replacement floor mats for automobiles. The floor mats are made of spun nylon on highly automated, expensive machinery. Hurst manufactures two mat styles: Plush and Deluxe. Hurst's unionized work force makes it difficult for Hurst to compete on price. So far has been able to successfully compete on quality, innovative design, and delivery schedule. However the leaders of Hurst's union are aggressive and are seeking additional work-related job guarantees. Hurst management would like to reduce its dependence on unionized labor.

Hurst's manufacturing process is overhead-driven; most of the overhead arises from the cost of machinery that produces the Plush and Deluxe floor mats. Nonunionized engineers and technicians maintain the equipment. Expensive lubricants and filters are required to operate the machines and

P 9–25: Mutu

require large amounts of electricity and natural gas. Each mat style is produced in batches that consist of 10 mats per batch. Plush and Deluxe do not put differential demands on the equipment other than through the amount of machine time required to produce each batch of mats. The following table summarizes the operating data for each mat style:

	Plush	*Deluxe*
Machine minutes per batch of 10 mats	12	9
Direct labor per batch of 10 mats	$4	$6
Direct material per batch of 10 mats	$7	$5
Number of batches per year	14,000	9,000

Overhead is allocated to the two mat styles using a predetermined overhead rate estimated from a flexible budget at the beginning of the year. Fixed overhead is estimated to be $680,000, and variable overhead is estimated to be $1.50 per machine minute. Management is debating whether to use machine minutes or direct labor cost as the overhead allocation base to allocate overhead to the two mat styles.

Required:

a. Calculate two overhead rates. The first uses machine minutes as the allocation base, and the second overhead rate uses direct labor cost as the allocation base. Round both overhead rates to two decimals.

b. Calculate the *total* product cost per batch of Plush and Deluxe mats using the two overhead rates calculated in (*a*).

c. Discuss the advantages and disadvantages of using machine minutes or direct labor cost as the allocation base for assigning overhead to the two mat styles.

9–25: Mutual Fund Company

Mutual Fund Company (MFC) is considering centralizing its overnight mail function. Five departments within MFC use overnight mail service: trades processing, trades verifications, securities processing, accounts control, and customer service. Although these departments send different types of packages (weight and content), they often send packages to the same destinations. Currently, each of these departments independently contracts for overnight mail service. The five departments' present rates are:

Present Rates per Package

	Number of Pounds in Package				
Department	*1*	*2*	*3*	*4*	*5*
Trades processing	$ 7.25	$ 8.50	$ 9.75	$11.00	$12.25
Trades verifications	7.75	8.75	9.75	10.75	11.75
Securities processing	8.00	9.50	11.00	12.50	14.00
Accounts control	10.00	12.00	14.00	15.50	16.50
Customer service	16.00	18.00	20.00	22.00	24.00

MFC has requested that each of the five departments submit an estimate of its overnight mail for the coming year. The departments' estimates are as follows: