Chapter 02
Cost Concepts and Behavior

Solutions to Review Questions

2-1.

Cost is a more general term that refers to a sacrifice of resources and may be either an opportunity cost or an outlay cost. An expense is an outlay cost charged against sales revenue in a particular accounting period and usually pertains only to external financial reports.

2-2.

Product costs are those costs that are attributed to units of production, while period costs are all other costs and are attributed to time periods.

2-3.

Outlay costs are those costs that represent a past, current, or future cash outlay. Opportunity cost is the value of what is given up by choosing a particular alternative.

2-4.

Common examples include the value forgone because of lost sales by producing low quality products or substandard customer service. For another example, consider a firm operating at capacity. In this case, a sale to one customer precludes a sale to another customer.

2-5.

Yes. The costs associated with goods sold in a period are not expected to result in future benefits. They provided sales revenue for the period in which the goods were sold; therefore, they are expensed for financial accounting purposes.

2-6.

The costs associated with goods sold are a product cost for a manufacturing firm. They are the costs associated with the product and recorded in an inventory account until the product is sold.

2-7.

Both accounts represent the cost of the goods acquired from an outside supplier, which include all costs necessary to ready the goods for sale (in merchandising) or production (in manufacturing).

The merchandiser expenses these costs as the product is sold, as no additional costs are incurred. The manufacturer transforms the purchased materials into finished goods and charges these costs, along with conversion costs to production (work in process inventory). These costs are expensed when the finished goods are sold.

2-8.

Direct materials:	**Materials in their raw or unconverted form, which become an integral part of the finished product are considered direct materials. In some cases, materials are so immaterial in amount that they are considered part of overhead.**
Direct labor:	**Costs associated with labor engaged in manufacturing activities. Sometimes this is considered as the labor that is actually responsible for converting the materials into finished product. Assembly workers,** cutters, finishers and similar "hands on" personnel are classified as **direct labor.**
Manufacturing overhead:	**All other costs directly related to product manufacture. These costs include the indirect labor and materials, costs related to the facilities and equipment required to carry out manufacturing operations, supervisory costs, and all other support activities.**

2-9.

Gross margin is the difference between revenue (sales) and cost of goods sold. Contribution margin is the difference between revenue (sales) and variable cost.

2-10.

Contribution margin is likely to be more important, because it reflects better how profits will change with decisions.

2-11.

Step costs change with volume in steps, such as when supervisors are added. Semivariable or mixed costs have elements of both fixed and variable costs. Utilities and maintenance are often mixed costs.

2-12.

Total variable costs change in direct proportion to a change in volume (within the relevant range of activity). Total fixed costs do not change as volume changes (within the relevant range of activity).

Solutions to Critical Analysis and Discussion Questions

2-13.

The statement is not true. Materials can be direct or indirect. Indirect materials include items such as lubricating oil, gloves, paper supplies, and so on. Similarly, indirect labor includes plant supervision, maintenance workers, and others not directly associated with the production of the product.

2-14.

No. Statements such as this almost always refer to the full cost per unit, which includes fixed and variable costs. Therefore, multiplying the cost per seat-mile by the number of miles is unlikely to give a useful estimate of flying one passenger. We should multiply the variable cost per mile by 1,980 miles to estimate the costs of flying a passenger from Detroit to Los Angeles.

2-15.

Marketing and administrative costs are treated as period costs and expensed for financial accounting purposes in both manufacturing and merchandising organizations. However, for decision making or assessing product profitability, marketing and administrative costs that can be reasonably associated with the product (product-specific advertising, for example) are just as important as the manufacturing costs.

2-16.

There is no "correct" **answer to this allocation problem. Common allocation procedures would include: (1) splitting the costs equally (25% each), (2) dividing the costs by the miles driven and charging based on the miles each person rides, (3) charging the incremental costs of the passengers (almost nothing), assuming you were going to drive to Texas anyway.**

2-17.

The costs will not change. Your allocation in 2-16 was not "incorrect," because the **purpose of the allocation is not to determine incremental costs.**

2-18.

Answers will vary. The major cost categories include servers (mostly fixed), personnel (mostly fixed), and licensing costs (mostly variable).

2-19.

Direct material costs include the cost of supplies and medicine. One possible direct labor cost would be nursing staff assigned to the unit. Indirect costs include the costs of hospital administration, depreciation on the building, security costs, and so on.

2-20.

Answers will vary. Common suggestions are number of students in each program, usage (cafeteria: meals; library: study rooms reserved; or career placement: interviews, for example), assuming usage is measured, or revenue (tuition dollars).

2-21.

No, R&D costs are relevant for many decisions. For example, should a program of research be continued? Was a previous R&D project profitable? Should we change our process of approving R&D projects? R&D costs are expensed (currently) for financial reporting, but for managerial decision-making the accounting treatment is not relevant.

Solutions to Exercises

2-22. (15 min.) Basic Concepts.

a. False. The statement refers to an expense. For example, R&D costs are incurred in expectation of future benefits.

b. True. Each unit of a product has the same amount of direct material (same cost per unit), but producing more units requires more material (and more cost).

c. False. Variable costs can be direct (direct materials) or indirect (lubricating oil for machines that produce multiple products.)

2-23. (15 min.) Basic Concepts.

	Cost Item	Fixed (F) Variable (V)	Period (P) Product (M)
a.	Depreciation on buildings for administrative staff offices	F	P
b.	Bonuses of top executives in the company	F	P
c.	Overtime pay for assembly workers	V	M

d.	**Transportation-in costs on materials purchased**	**V**	**M**
e.	Assembly line workers' wages	**V**	**M**
f.	**Sales commissions for sales personnel**	**V**	**P**
g.	**Administrative support for sales supervisors**	**F**	**P**
h.	Controller's office rental	**F**	**P**
i.	**Cafeteria costs for the factory**	**F**	**M**
j.	**Energy to run machines producing units of output in the factory**	**V**	**M**

2-24. (10 min.) Basic Concepts.

a. Property taxes on the factory.	**C**
b. Direct materials used in production process.	**P**
c. Transportation-in costs on materials purchased.	**P**
d. Lubricating oil for plant machines.	**C**
e. Assembly line worker's salary.	**B**

2-25. (15 min.) Basic Concepts.

	Concept	Definition
9	**Period cost**	**Cost that can more easily be attributed to time intervals.**
6	**Indirect cost**	**Cost that cannot be directly related to a cost object.**
10	**Fixed cost**	**Cost that does not vary with the volume of activity.**
2	**Opportunity cost**	**Lost benefit from the best forgone alternative.**
11	**Outlay cost**	**Past, present, or near-future cash flow.**
8	**Direct cost**	**Cost that can be directly related to a cost object.**
5	**Expense**	**Cost charged against revenue in a particular accounting period.**
3	**Cost**	**Sacrifice of resources.**
1	**Variable cost**	**Cost that varies with the volume of activity.**
4	**Full absorption cost**	**Cost used to compute inventory value according to GAAP.**
7	**Product cost**	**Cost that is part of inventory.**

2-26. (15 min.) Basic Concepts.

Cost Item	Fixed (F) Variable (V)	Period (P) Product (M)
a. Depreciation on pollution control equipment in the plant..	**F**	**M**
b. Chief financial officer's salary**.....**	**F**	**P**
c. Power to operate factory equipment	**V**	**M**
d. Commissions paid to sales personnel.....	**V**	**P**
e. Office supplies for the human resources manager.....	**F**	**P**

2-27. (15 min.) Basic Concepts.

a.	**Variable production cost per unit: ($240 + $40 + $10 + $20) .....**	**$310**
b.	**Variable cost per unit: ($310 + $30).....**	**$340**
c.	**Full cost per unit: [$340 + ($100,000 ÷ 1,000 units)].....**	**$440**
d.	**Full absorption cost per unit: [$310 + ($60,000 ÷ 1,000)].....**	**$370**
e.	**Prime cost per unit. (materials + labor + outsource) .....**	**$290**
f.	**Conversion cost per unit: (labor + overhead + outsource) .....**	**$360**
g.	**Contribution margin per unit: ($600 – $340).....**	**$260**
h.	**Gross margin per unit: ($600 – full absorption cost of $370).....**	**$230**
i.	**Suppose the number of units decreases to 800 units per month, which is within the relevant range. Which parts of (a) through (h) will change? For each amount that will change, give the new amount for a volume of 800 units.**	**c, d, f and h will change, as follows**

c. Full cost = $340 + ($100,000 ÷ 800) = $465
d. Full absorption cost = $310 + ($60,000 ÷ 800) = $385
f. Conversion costs = $240 + $20 + ($60,000 ÷ 800) + $40 = $375
h. Gross margin = $600 – $385 = $215

2-28. (15 min.) Basic Concepts: Terracotta, Inc.

a.	**Prime cost per unit: (materials + labor) .....**	**$10**
b.	**Contribution margin per unit: ($25 – $18) .....**	**$7**
c.	**Gross margin per unit: ($25 – full absorption cost of $18.50) .....**	**$6.50**
d.	**Conversion cost per unit: (labor + overhead).....**	**$12.50**
e.	**Variable cost per unit: ($15 + $3).....**	**$18**
f.	**Full absorption cost per unit: [$15 + ($1,050,000 ÷ 300,000)].....**	**$18.50**
g.	**Variable production cost per unit: ($4 + $6 + $5) .....**	**$15**

h.	**Full cost per unit. [$18 + ($1,350,000 ÷ 300,000 units)]**	**$22.50**
i.	**Suppose the number of units increases to 400,000 units per month, which is within the relevant range. Which parts of (a) through (h) will change? For each amount that will change, give the new amount for a volume of 400,000 units.**	**c, d, f and h will change, as follows**

c. Gross margin = $25.00 – $17.63 = $7.37

d. Conversion costs = $4 + $5 + ($1,050,000 ÷ 400,000) = $11.63

f. Full absorption cost = $15 + ($1,050,000 ÷ 400,000) = $17.63

h. Full cost = $18 + ($1,350,000 ÷ 400,000) = $21.38

2-29. (15 min.) Cost Allocation—Ethical Issues

This problem is based on the experience of the authors' **research at several companies.**

a. Answers will vary as there are several defensible bases on which to allocate the product development costs. As an example, many government-purchasing contracts are based on the cost of the product or service. In this case, using expected sales (units or revenue) leads to a potential circularity. Price depends on cost, which depends on sales, which depends on price.

b. The company has an incentive to allocate as much cost as possible to government sales. This cost will be reimbursed (and the government may be less price-sensitive). Of course, the government recognizes this and has detailed allocation guidelines in place and an agency (the Defense Contract Audit Agency) that monitors contracts and the allocation of costs.

2-30. (15 min.) Cost Allocation—Ethical Issues

This problem is based on the experience of the authors' research at several companies.

a. Answers will vary as there are several defensible bases on which to allocate the common costs. One possibility is relative sales revenue. (We ignore here whether we should allocate these costs, something we discuss in chapter 4.)

b. You should explain to Star that you cannot agree with the allocation basis, especially given the reason for selecting the basis. If this fails to persuade Star, you should disclose to Star's boss your disagreement with the analysis and the relation between **Star and the vendor.**

2-31. (30 min.) Prepare Statements for a Manufacturing Company: Hill Components.

Hill Components
Cost of Goods Sold Statement
For the Year Ended December 31

Beginning work in process inventory			**$67,730**
Manufacturing costs:			
Direct materials:			
Beginning inventory	**$48,100**		
Purchases	**55,900 (a)***		
Materials available	**$104,000**		
Less ending inventory	**44,200**		
Direct materials used		**$59,800**	
Other manufacturing costs		**15,470 ****	
Total manufacturing costs			**75,270 (c)**
Total costs of work in process			**$143,000**
Less ending work in process			**71,500**
Cost of goods manufactured			**$ 71,500 (b)**
Beginning finished goods inventory			**15,600**
Finished goods available for sale			**$ 87,100**
Ending finished goods inventory			**18,200**
Cost of goods sold			**$68,900**

*** Letters (a), (b), and (c) refer to amounts found in solutions to requirements a, b, and c.**
**** Difference between total manufacturing costs of $75,270 and direct materials used of $59,800.**

2-32. (10 min.) **Prepare Statements for a Service Company: Chuck's Brok**erage Service.

	A	B	C
1	Chuck's Brokerage Service		
2	Income Statement		
3	For the Month Ending October 31		
4			
5	Sales revenue		
6	Brokerage commissions	$ 9,000,000	
7	Fees for investment advice	4,500,000	
8	Total revenues		$ 13,500,000
9	Cost of services sold		
10	Labor cost for advice	$ 2,400,000	
11	Fees paid to execute trades	6,000,000	
12	Total costs of services		8,400,000
13	Gross margin		$ 5,100,000
14	Marketing and administrative costs		
15	Advertising and marketing	$ 270,000	
16	Building rent and utilities	525,000	
17	Managers' salaries	900,000	
18	Sales commissions to brokers	750,000	
19	Training programs for brokers	1,275,000	
20	Total marketing and administrative costs		3,720,000
21	Operating profit		$ 1,380,000
22			

2-33. Prepare Statements for a Service Company: Where2 Services.

	A	B	C	D	E	F
1						
2						
3	Where2 Services					
4	Income Statement					
5	For the Month Ending March 31					
6						
7	Sales revenue		$ 16,000			
8	Cost of services sold					
9	Wages of part time employees	$ 5,000				
10	Printing, fax, and computing costs	3,750				
11	Total cost of services sold		8,750			
12	Gross margin		$ 7,250			
13	Marketing and administrative costs					
14	Advertising and marketing	$ 4,000				
15	Building rent and utilities	2,000				
16	Training costs	500				
17	Travel expenses	2,500				
18	Total marketing and administrative costs		9,000			
19	Operating profit (loss)		$ (1,750)			
20						
21						
22						
23						

2-34. (10 min.) Prepare Statements for a Service Company: Jupiter Consultants

Sales revenue	**$8,500,000**	**(Given)**
Cost of services sold (b)	**4,450,000**	**(Sales revenue – gross margin)**
Gross margin	**$4,050,000**	**(Given)**
Marketing and administrative costs (a)	**2,525,000**	**(Gross margin – operating profit)**
Operating profit	**$1,525,000**	**(Given)**

2-35. (20 min.) Prepare Statements for a Service Company: Lead! Inc.

You can solve this in the order shown below.

Lead!, Inc.
Income Statement
For the Month Ended April 30

Sales revenue	**$600,000**	**a**
Cost of services sold	**384,000**	**c**
Gross margin	**$216,000**	**d**
Marketing and administrative costs	**96,000**	**e**
Operating profit ($600,000 x 20%)	**$120,000**	**b**

a. Given

b. $120,000 = 20% x $600,000.

c. To find the cost of services sold plus marketing and administrative costs, start with the operating profit (b). Then cost of services plus marketing and administrative costs is $480,000 (= $600,000 – $120,000). But, marketing and administrative costs equal 25% of cost of services sold, so,

Cost of services sold + marketing and administrative costs = $480,000 and

Marketing and adminstrative costs = .25 x Cost of services sold.

Combining these equations yields,

1.25 x Cost of services sold = $480,000

or cost of services sold = $384,000 (= $480,000 ÷ 1.25).

d. $216,000 = $600,000 – $384,000.

e. $96,000 = 25% x $384,000.

2-36. (30 min.) Prepare Statements for a Manufacturing Company: Todd Machining Company.

Todd Machining Company
Cost of Goods Sold Statement
For the Year Ended December 31

Beginning work-in-process inventory			**$ 116,000**
Manufacturing costs:			
Direct materials:			
Beginning inventory	**$ 96,000**		
Purchases.....	**598,000**		
Materials available.....	**$694,000**		
Less ending inventory.....	**118,000**		
Direct materials used.....		**$576,000 (a)***	
Other manufacturing costs.....		**1,584,800 ****	
Total manufacturing costs			**2,160,800 (c)**
Total costs of work in process.....			**$ 2,276,800**
Less ending work in process			**112,000**
Cost of goods manufactured...			**$ 2,164,800 (b)**
Beginning finished goods inventory.....			**97,600**
Finished goods available for sale.....			**$ 2,262,400**
Ending finished goods inventory			**90,000**
Cost of goods sold			**$2,172,400**

*** The best approach to solving this problem is to lay out the format of the Cost of Goods Sold Statement first, then fill in the amounts known. Next find the subtotals that are possible (e.g., Finished goods available for sale). Finally, solve for letters (a), (b), and (c) where (a), (b), and (c) refer to amounts found in solutions to requirements a, b, and c.**

**** Difference between total manufacturing costs and direct materials used.**

2-37. (15 min.) Basic Concepts

a. From the basic inventory equation,
Beginning Inventory + Transferred in
= Transferred out + Ending Inventory, so
Beginning Materials Inventory, January 1,
= Ending balance – Transferred in + Transferred out
= $12,300 – $48,300 + $43,800 ..... = $7,800

b. Total manufacturing costs = Cost of goods manufactured
– Beginning work-in-process + Ending work-in-process
= $163,350 – $8,100 + $11,400 ..... = $166,650
(also can be found solving for Transferred in to Finished Goods)

c. Total manufacturing costs = Direct materials + Direct labor
+ Manufacturing overhead, so,
Direct labor = Total manufacturing costs
– Direct materials used – Manufacturing overhead,
= $166,650 – $43,800 – $41,400 ..... = $81,450

d. Sales revenue = Gross margin + Cost of Goods Sold
= $147,750 + $168,150 ..... = $315,900

2-38. (15 min.) Basic Concepts.

a. From the basic inventory equation,
Beginning work-in-process inventory + Total manufacturing cost
= Cost of goods manufactured + Ending work-in-process inventory, so
Ending work-in-process inventory, March 31,
= Beginning balance + Total manufacturing cost – Cost of goods manufactured
= $5,000 + $127,000 – $130,000 ..... = $2,000

b. Purchases of direct materials = Ending direct materials inventory + Direct materials used – Beginning materials inventory
= $13,500 + $31,000 – $16,000 ..... = $28,500
(also can be found solving for Transferred in to Finished Goods)

c. Cost of goods sold = Sales revenue – Gross Margin
= $240,000 – $85,000 ..... = $155,000

d. Manufacturing overhead = Total manufacturing cost – Direct materials used – Direct labor
= $127,000 – $31,000 – $60,000 ..... = $36,000

2-39. (15 min.) Prepare Statements for a Merchandising Company: **Angie's** Apparel.

Angie's **Apparel**
Income Statement
For the Month Ended July 31

Sales revenue	**$190,000**
Cost of goods sold (see statement below)	**129,500**
Gross margin	**$60,500**
Marketing and administrative costs ($14,000 + $9,000 + $3,000 + $5,500)	**31,500**
Operating profit	**$29,000**

Angie's Apparel
Cost of Goods Sold Statement
For the Month Ended July 31

Merchandise inventory, July 1		**$ 3,000**
Merchandise purchases	**$120,000**	
Transportation-in	**9,000**	
Total cost of goods purchased		**129,000**
Cost of goods available for sale		**$132,000**
Merchandise inventory, July 31		**2,500**
Cost of goods sold		**$129,500**

2-40. (15 min.) Prepare Statements for a Merchandising Company: Hill Street Electronics.

Hill Street Electronics
Income Statement
For the Year Ended February 28

Sales revenue	**$8,000,000**
Cost of goods sold (see statement below)	**5,660,000**
Gross margin	**$2,340,000**
Marketing and administrative costs ($440,000 + $270,000 + $580,000 + $1,300,000)	**2,590,000**
Operating profit (loss)	**$(250,000)**

Hill Street Electronics
Cost of Goods Sold Statement
For the Year Ended February 28

Merchandise inventory, March 1		**$ 370,000**
Merchandise purchases	**$5,500,000**	
Transportation-in	**210,000**	
Total cost of goods purchased		**5,710,000**
Cost of goods available for sale		**$6,080,000**
Merchandise inventory, February 28		**420,000**
Cost of goods sold		**$5,660,000**

2-41. (10 min.) Cost Behavior for Forecasting: Lima Company.

The variable costs will be 1/6 lower because there will be a decrease of 30,000 – 25,000 = 5,000 units (1/6 = 5,000 ÷ 30,000).

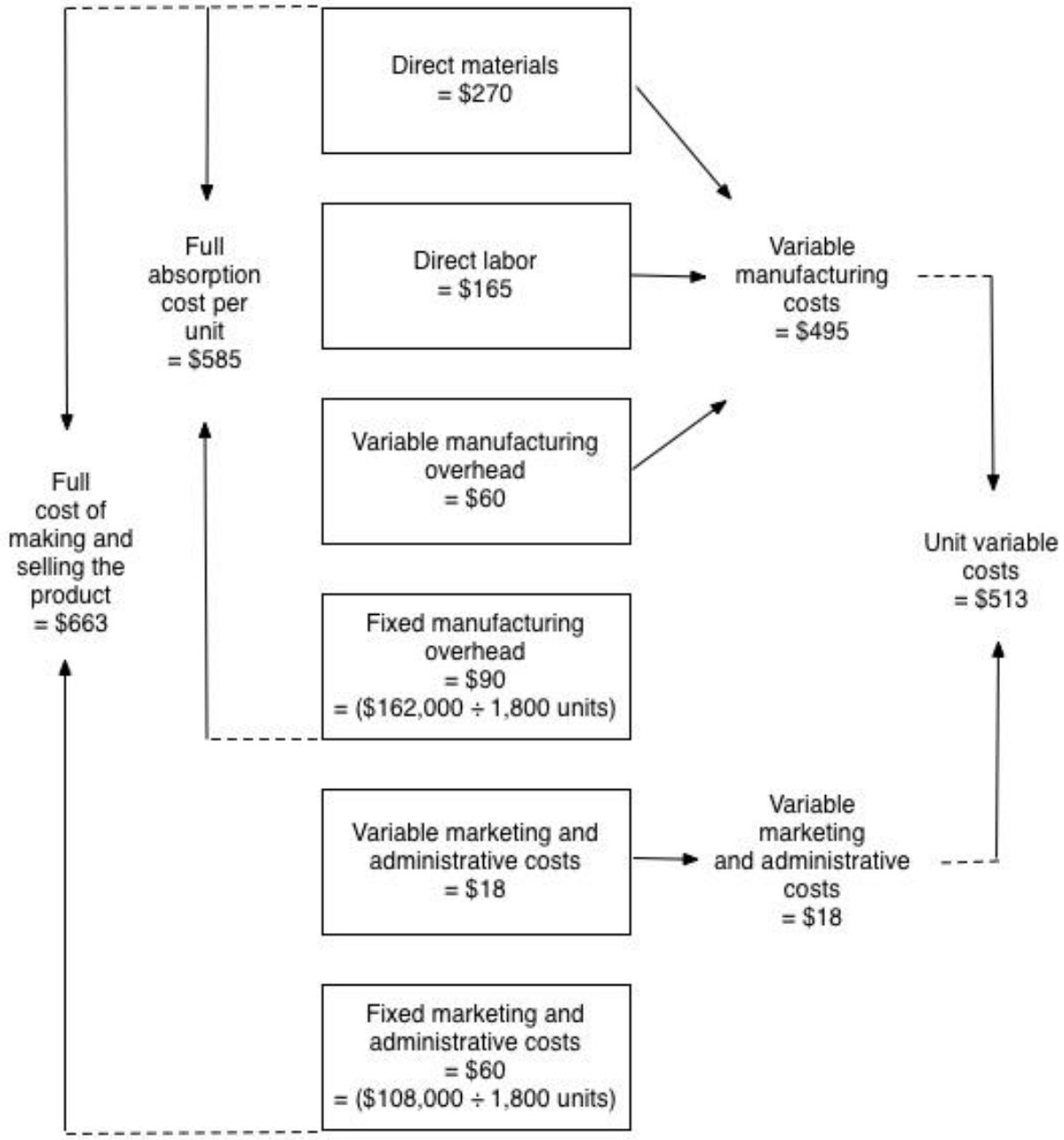
Variable costs:	
Direct materials used ($510,000 x 5/6)	**$ 425,000**
Direct labor ($1,120,000 x 5/6)	**933,333**
Indirect materials and supplies ($120,000 x 5/6)	**100,000**
Power to run plant equipment ($140,000 x 5/6)	**116,667**
Total variable costs	**$1,575,000**
Fixed costs:	
Supervisory salaries	**$ 465,000**
Plant utilities (other than power to run plant equipment)	**110,000**
Depreciation on plant and equipment	**67,500**
Property taxes on building	**97,500**
Total fixed costs	**740,000**
Total costs for 51,000 units	**$2,315,000**
Unit costs (= $2,315,000 ÷ 25,000)	**$92.60**

Note that the variable cost per unit is $63 at both 30,000 units and at 25,000 units.

Total variable costs at 30,000 units is $1,890,000 (= $510,000 + $1,120,000 + $120,000 + $140,000).

Unit variable costs = $63 per unit = ($1,890,000 ÷ 30,000 units) or ($1,575,000 ÷ 25,000 units).

2-42. (30 min.) Components of Full Costs: Karen Corporation



a. Variable manufacturing cost: $270 + $165 + $60= $495

b. Variable cost: $270 + $165 + $60 + $18 = $513

c. Full absorption cost: $270 + $165 + $60 + ($162,000 ÷ 1,800 units) = $585

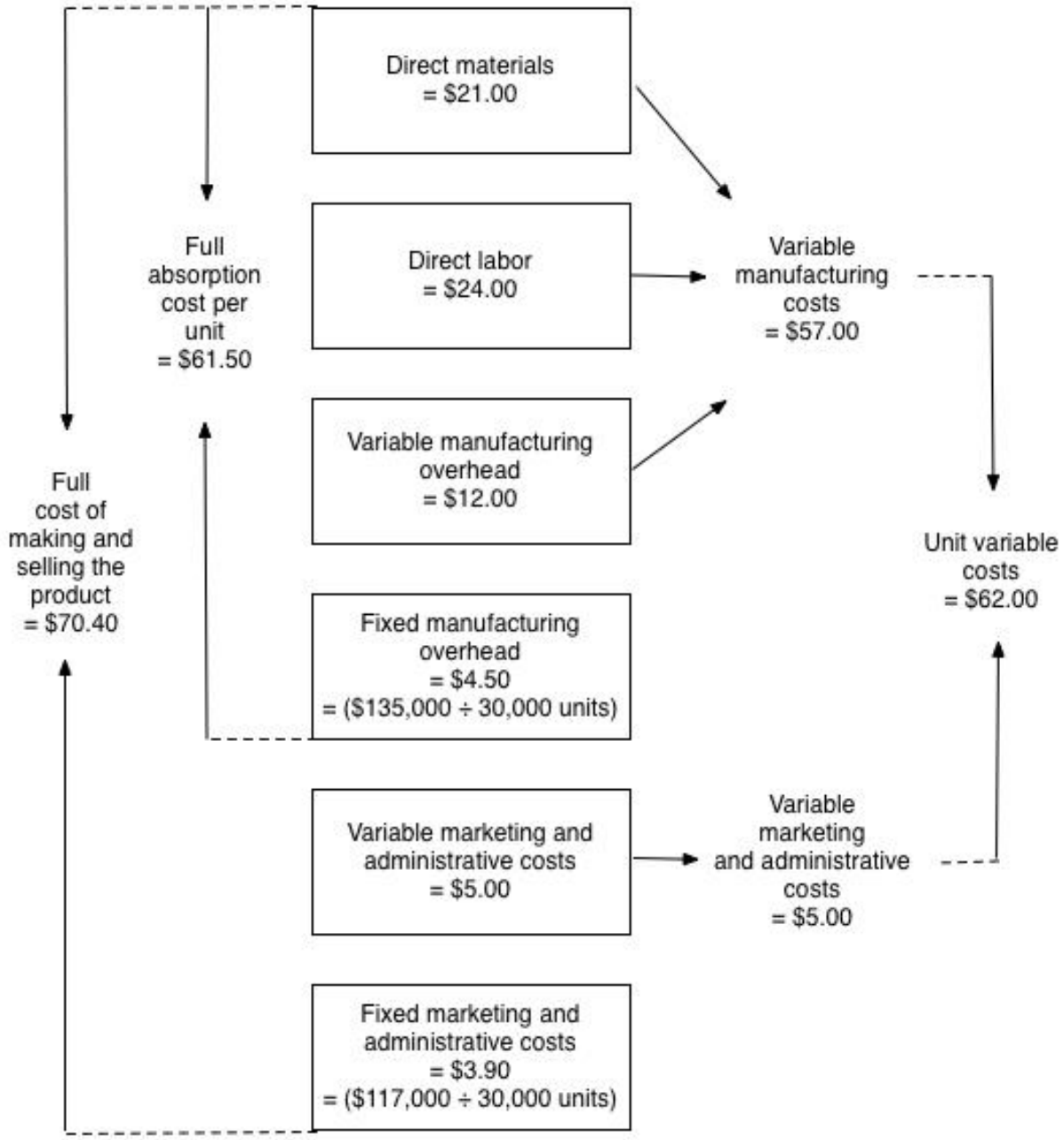
d. Full cost: $270 + $165 + $60 + $18 + ($162,000 ÷ 1,800 units) + ($108,000 ÷ 1,800 units) = $663

2-43. (15 min.) Components of Full Costs: Karen Corporation.

a. Product cost = Direct materials + Direct labor + Manufacturing overhead.
Product cost per unit: $270 + $165 + $60 + ($162,000 ÷ 1,800 units) = $585

b. Period costs = Marketing and administrative costs.
Period costs for the period: $108,000 + ($18 x 1,800 units) = $140,400

2-44. (30 min.) Components of Full Cost: Larcker Manufacturing.



a. Variable cost: $21.00 + $24.00 + $12.00 + $5.00 = $62.00

b. Variable manufacturing cost: $21.00 + $24.00 + $12.00 = $57.00

c. Full-absorption cost: $21.00 + $24.00 + $12.00 + ($135,000 ÷ 30,000 units) = $61.50

2-44. (continued)

d. Full cost: $21.00 + $24.00 + $12.00 + ($135,000 ÷ 30,000 units) + $5.00 + ($117,000 ÷ 30,000 units) = $70.40

e. Profit margin = Sales price – full cost = $79.00 – $70.40 = $8.60

f. Gross margin = Sales price – full absorption cost = $79.00 – $61.50 = $17.50

g. Contribution margin = Sales price – variable cost = $79.00 – $62.00 = $17.00

2-45. (20 Min.) Gross Margin and Contribution Margin Income Statements: Larcker Manufacturing.

Gross Margin Income Statement		Contribution Margin Income Statement	
Sales revenue(a)	$2,370,000	Sales revenue	$2,370,000
Variable manufacturing costs (b)	1,710,000	Variable manufacturing costs	1,710,000
Fixed manufacturing overhead costs	135,000	Variable marketing and administrative costs	150,000
Gross margin	$525,000	Contribution margin	$510,000
Variable marketing and administrative costs (c)	150,000	Fixed manufacturing overhead costs	135,000
Fixed marketing and administrative costs	117,000	Fixed marketing and administrative costs	117,000
Operating profit	$258,000	Operating profit	$258,000

(a) $79 x 30,000 units = $2,370,000

(b) $57 x 30,000 units = $1,710,000; $57 = ($21 direct material + $24 direct labor + $12 variable manufacturing overhead).

(c) $5 x 30,000 units = $150,000

2-46. (20 Min.) Gross Margin and Contribution Margin Income Statements: Fremont Products.

Gross Margin Income Statement	
Sales revenue	$132,000
Variable manufacturing costs[a]	59,500
Fixed manufacturing costs	22,000
Gross margin	$ 50,500
Variable marketing and administrative costs	6,800
Fixed marketing and administrative costs	16,000
Operating profit	$ 27,700

Contribution Margin Income Statement	
Sales revenue	$132,000
Variable manufacturing costs	59,500
Variable marketing and administrative costs	6,800
Contribution margin	$ 65,700
Fixed manufacturing costs	22,000
Fixed marketing and administrative costs	16,000
Operating profit	$ 27,700

[a] Variable manufacturing costs = $34,000 + $17,000 + $8,500 = $59,500

2-47. (20 Min.) Gross Margin and Contribution Margin Income Statements: Carmen Beverages.

Gross Margin Income Statement	
Sales revenue[a]	$60,160
Variable manufacturing costs[b]	7,896
Fixed manufacturing overhead costs[c]	17,296
Gross margin	$34,968
Variable marketing and administrative costs[d]	9,024
Fixed marketing and administrative costs[e]	18,800
Operating profit	$7,144

Contribution Margin Income Statement	
Sales revenue	$60,160
Variable manufacturing costs	7,896
Variable marketing and administrative costs	9,024
Contribution margin	$43,240
Fixed manufacturing overhead costs	17,296
Fixed marketing and administrative costs	18,800
Operating profit	$7,144

[a] Revenue = $3.20 x 18,800 = $60,160
[b] Variable manufacturing costs = ($0.20 + $0.16 + $0.06) x 18,800 = $7,896
[c] Fixed manufacturing overhead costs = $0.92 x 18,800 = $17,296
[d] Variable marketing and administrative costs = $0.48 x 18,800 = $9,024
[e] Fixed marketing and administrative costs = $1.00 x 18,800 = $18,800

2-48. (30 min.) Value Income Statement: Greg**'s Diner.**

a.

Greg's Diner
Value Income Statement
For the year 2 ending December 31

	Nonvalue-added activities	Value-added activities	Total
Sales revenue		$2,000,000	$2,000,000
Cost of merchandise			
Cost of food served[a]	$ 105,000	595,000	700,000
Gross margin	$ (105,000)	$ 1,405,000	$ 1,300,000
Operating expenses			
Employee salaries and wages[b]	75,000	425,000	500,000
Managers' salaries[c]	40,000	160,000	200,000
Building costs[d]	60,000	240,000	300,000
Operating income (loss)	$(280,000)	$ 580,000	$ 300,000

[a] 15% nonvalue-added activities (= 5% not used + 10% incorrectly prepared)
[b] 15% nonvalue-added activities
[c] 20% nonvalue-added activities
[d] 20% unused and nonvalue-added activities

b. The information in the value income statement enables Greg to identify nonvalue-added activities. He could eliminate such activities without reducing value to customers. Greg can take steps to ensure that food is used prior to the expiration date, either by changing scheduling or purchasing procedures. He can also spend time training staff to take orders more carefully. Preparing a Year 3 statement helps Greg see whether the company is improving in reducing nonvalue-added activities.

2-49. (30 min.) **Value Income Statement: Paul's Limo Service.**

a.

	A	B	C	D	E
1	Paul's Limo Service				
2	Value Income Statement				
3	For the Month Ending June 30				
4		Nonvalue-added		Value-added	
5		Activities		Activities	Total
6					
7	Sales revenue			$ 25,000	$ 25,000
8	Cost of services sold				
9	Variable costs of operations, excluding labor costs	375	a	7,125	7,500
10	Employee wages and salaries	500	a	9,500	10,000
11	Fixed cost of automobiles	1,000	b	1,500	2,500
12	Gross margin	$ (1,875)		$ 6,875	$ 5,000
13	Administrative expenses				
14	Managers' salaries	200	c	1,800	2,000
15	Building costs	125	c	1,125	1,250
16	Operating income (loss)	$ (2,200)		$ 3,950	$ 1,750
17					
18	a. 5% nonvalue-added.				
19	b. 40% nonvalue-added.				
20	c. 10% nonvalue-added.				

b. The information in the value income statement enables Paul to identify nonvalue-added activities. He could eliminate such activities without reducing value to customers. Paul can take steps to improve how directions are given to drivers and reduce customer complaints, for example. By preparing the same information in July, Paul can see how he is improving (or becoming worse) in reducing nonvalue-added activities.

Solutions to Problems

2-50. (30 min.) Cost Concepts: Santa Inez, Inc.

a.

Prime costs = direct materials + direct labor

Direct materials = beginning inventory + purchases – ending inventory
= $12,000 + $160,000 – $10,000
= $162,000

Direct labor is given as $128,000

Prime costs = $162,000 + $128,000
= $290,000

b.

Conversion costs = Direct labor + Manufacturing overhead

Conversion costs = $128,000 + $168,000 = $296,000

c.

Total manufacturing costs = Direct materials + Direct labor + Manufacturing overhead
= $162,000 (from a above) + $128,000 + $168,000
= $458,000

d.

Cost of goods manufactured = Beginning Work In Process + Total manufacturing costs – Ending Work In Process
= $6,000 + $458,000 (from c above) – $4,000
= $460,000

e.

Cost of Goods Sold	=	Cost of Goods Manufactured	+	Beginning Finished Goods Inventory	–	Ending Finished Goods Inventory
	=	$460,000 (from d above)	+	$36,000	–	$48,000
	=	$448,000				

2-51. (30 Minutes) Cost Concepts: Emporia Precision Parts.

a. $87,000.

Prime costs	**=**	**Direct materials used + Direct labor costs**
Direct materials used	**=**	**Prime costs – Direct labor costs**
	=	**$147,000 – $60,000**
	=	**$87,000**

b. $18,000.

Direct materials used	**=**	**Beginning inventory + purchases – ending inventory**
Direct materials, beginning inventory	**=**	**Direct materials used – purchases + ending inventory**
		$87,000 – $84,000 + $15,000
	=	**$18,000**

c. $180,000.

Total manufacturing costs	**=**	**Prime costs + Conversion costs – Direct labor cost**
Conversion cost	**=**	**Total manufacturing costs – Prime costs + Direct labor cost**
	=	**$267,000 – $147,000 + $60,000**
	=	**$180,000**

d. $6,000.

Work-in-process, ending	**=**	**Work-in-process, beginning + Total manufacturing costs – Cost of goods manufactured**
		$9,000 + $267,000 – $270,000
	=	**$6,000**

e. $120,000.

Conversion cost	**=**	**Direct labor costs + Manufacturing overhead**
Manufacturing overhead	**=**	**Conversion costs – Direct labor costs**
	=	**$180,000 – $60,000**
	=	**$120,000**

2-51. (continued)

f. $14,000.

Cost of goods sold = Finished goods, beginning + Cost of goods manufactured – Finished goods, ending

Finished goods, beginning = Cost of goods sold – Cost of goods manufactured + Finished goods, ending

$212,000 – $270,000 + $72,000

= $14,000

2-52. (30 minutes) Cost Concepts: Princeton Fabrication, Inc.

a. Amounts per unit:

(1) $434.

Variable manufacturing cost = Manufacturing overhead + Direct labor + Direct materials

= $140 + $70 + $224

= $434

(2) $658.

Full unit cost = All unit fixed costs + All unit variable costs

Unit fixed manufacturing = ($100,800 ÷ 1,200 units) = $84

Unit fixed marketing and administrative cost = ($134,400 ÷ 1,200 units) = $112

= $84 + $112 + $70 + $224 + $140 + $28

= $658

(3) $462.

Variable cost = All variable unit costs

= $28 + $140 + $70 + $224

= $462

(4) $518.

Full absorption cost = Fixed and variable manufacturing overhead + Direct labor + direct materials

= $84 + $140 + $70 + $224

= $518

(5) $294.

Prime cost = Direct labor + Direct materials

= $70 + $224

= $294

2-52. (continued)

(6) $294.

Conversion cost = Direct labor + Manufacturing overhead
= $70 + ($140 + $84)
= $294

(7) $238.

Profit margin = Sales price – Full cost
= $896 – $658
= $238

(8) $434.

Contribution margin = Sales price – Variable costs
= $896 – $462
= $434

(9) $378.

Gross margin = Sales price – Full absorption cost
= $896 – $518
= $378

b. As the number of units decreases (reflected in the denominator), fixed manufacturing cost per unit increases. The numerator (i.e., total fixed costs) remains the same.

2-53. (30 min.) Prepare Statements for a Manufacturing Company: Pioneer Parts.

Pioneer Parts
Statement of Cost of Goods Sold
For the Year Ended December 31
($000)

Work in process, Jan. 1			$ 24
Manufacturing costs:			
Direct materials:			
Beginning inventory, Jan. 1	$ 18		
Add material purchases	1,640		
Direct materials available	1,658		
Less ending inventory, Dec. 31	16		
Direct materials used		$ 1,642	
Direct labor		2,120	
Manufacturing overhead:			
Indirect factory labor	560		
Indirect materials and supplies	140		
Factory supervision	420		
Factory utilities	180		
Factory and machine depreciation	2,320		
Property taxes on factory	56		
Total manufacturing overhead		3,676	
Total manufacturing costs			7,438
Total cost of work in process during the year			7,462
Less work in process, Dec. 31			28
Costs of goods manufactured during the year			7,434
Beginning finished goods, Jan. 1			328
Finished goods inventory available for sale			7,762
Less ending finished goods inventory, Dec. 31			294
Cost of goods sold			$7,468

2-53. (continued)

Pioneer Parts
Income Statement
For the Year Ended December 31
($000)

Sales revenue		$9,080
Less: Cost of goods sold		7,468
Gross margin		$1,612
Administrative costs	$720	
Marketing costs	300	
Total marketing and administrative costs		1,020
Operating profit		$ 592

2-54. (30 min.) Prepare Statements for a Manufacturing Company: Butte Components.

Butte Components
Statement of Cost of Goods Sold
For the Year Ended December 31
($000)

Work in process, Jan. 1			$ 76
Manufacturing costs:			
Direct materials:			
Beginning inventory, Jan. 1	$ 48		
Add materials purchases	5,150		
Direct materials available	$5,198		
Less ending inventory, Dec. 31	55		
Direct materials used		$ 5,143	
Direct labor		6,500	
Manufacturing overhead:			
Depreciation (factory)	$2,780		
Depreciation (machines)	4,620		
Indirect labor (factory)	1,670		
Indirect materials (factory)	480		
Property taxes on factory	185		
Utilities (factory)	530		
Total manufacturing overhead		10,265	
Total manufacturing costs			21,908
Total cost of work in process during the year			$21,984
Less work in process, Dec. 31			68
Costs of goods manufactured during the year			$21,916
Beginning finished goods, Jan. 1			987
Finished goods inventory available for sale			$22,903
Less ending finished goods inventory, Dec. 31			1,013
Cost of goods sold			$21,890

2-54. (continued)

Butte Components
Income Statement
For the Year Ended December 31
($000)

Sales revenue		$30,110
Less: Cost of goods sold		21,890
Gross margin		$ 8,220
Administrative costs	$2,100	
Selling costs	1,070	
Total marketing and administrative costs		3,170
Operating profit		$ 5,050

2-55. (30 min.) Prepare Statements for a Manufacturing Company: Oakdale Tool & Die.

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Oakdale Tool & Die
Statement of Cost of Goods Sold
For the Year Ended December 31
($ 000)

Beginning work in process, Jan. 1			$ 96
Manufacturing costs:			
Direct materials:			
Beginning inventory, Jan. 1	$ 36		
Add: Purchases	10,950		
Direct materials available	10,986		
Less ending inventory, Dec. 31	42		
Direct materials used		$10,944	
Direct labor		2,520	
Manufacturing overhead:			
Indirect factory labor	2,736		
Factory supervision	1,470		
Indirect materials and supplies	2,055		
Building utilities (90% of total)	3,375		
Building & machine depreciation (75% of $2,700)	2,025		
Property taxes—factory (80% of total)	2,016		
Total manufacturing overhead		13,677	
Total manufacturing costs			27,141
Total cost of work in process during the year			27,237
Less work in process, Dec. 31			87
Costs of goods manufactured during the year			27,150
Beginning finished goods, Jan. 1			162
Finished goods available for sale			27,312
Less ending finished goods, Dec. 31			195
Cost of goods sold			$ 27,117

2-55. (continued)

Oakdale Tool & Die
Income Statement
For the Year Ended December 31
($ 000)

Sales revenue		$38,910
Less: Cost of goods sold (per statement)		27,117
Gross profit		$ 11,793
Marketing and administrative costs:		
Depreciation (25% of total)	$ 675	
Utilities (10% of total)	375	
Property taxes (20% of total)	504	
Administrative costs	4,800	
Marketing costs	2,613	
Total marketing and administrative costs		8,967
Operating profit		$ 2,826

2-56. (10 Min.) Cost Allocation with Cost Flow Diagram: Coastal Computer.

a.

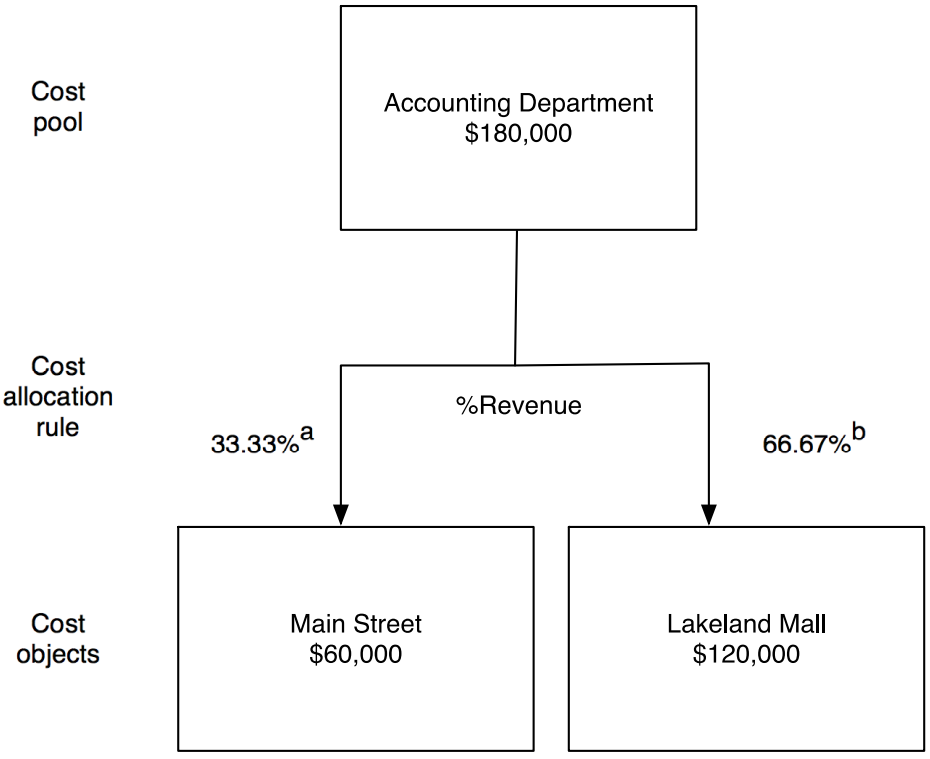
(1)

	Main Street	Lakeland Mall	Total
Number of computers sold.....	2,000	1,600	3,600
Percentage	55.56%	44.44%	100%
Allocated Accounting Department cost ($180,000) ...	$100,000	$80,000	$180,000

(2)

	Main Street	Lakeland Mall	Total
Revenue	$1,000,000	$2,000,000	$3,000,000
Percentage	33.33%	66.67%	100%
Allocated Accounting Department cost ($180,000) ...	$60,000	$120,000	$180,000

b.



[a] 33.33% = $1,000,000 ÷ ($1,000,000 + $2,000,000)
[b] 66.67% = $2,000,000 ÷ ($1,000,000 + $2,000,000)

2-57. (20 Min.) Cost Allocation with Cost Flow Diagram: Wayne Casting, Inc.

a.

(1)

	Chillicothe Metals	Ames Supply	Total
Material purchased (tons).....	130	120	250
Percentage	52%	48%	100%
Allocated waste handling cost ($300,000).....	$156,000	$144,000	$300,000

(2)

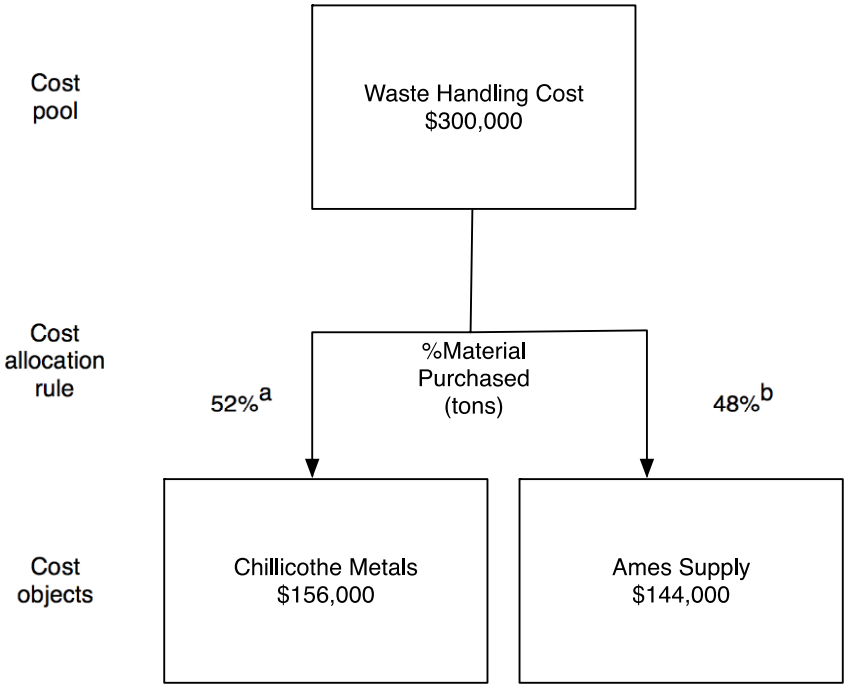
	Chillicothe Metals	Ames Supply	Total
Amount of waste (tons).....	12.8	2.2	15
Percentage	85.33%	14.67%	100%
Allocated waste handling cost ($300,000).....	$256,000	$44,000	$300,000

(3)

	Chillicothe Metals	Ames Supply	Total
Cost of materials purchased...	$624,000	$876,000	$1,500,000
Percentage	41.6%	58.4%	100%
Allocated waste handling cost ($300,000).....	$124,800	$175,200	$300,000

2-57. (continued)

b.



a 52% = 130 tons ÷ (130 tons + 120 tons)
b 48% = 120 tons ÷ (130 tons + 120 tons)

2-58. (20 Min.) Cost Allocation with Cost Flow Diagram: Pacific Business School.

a.

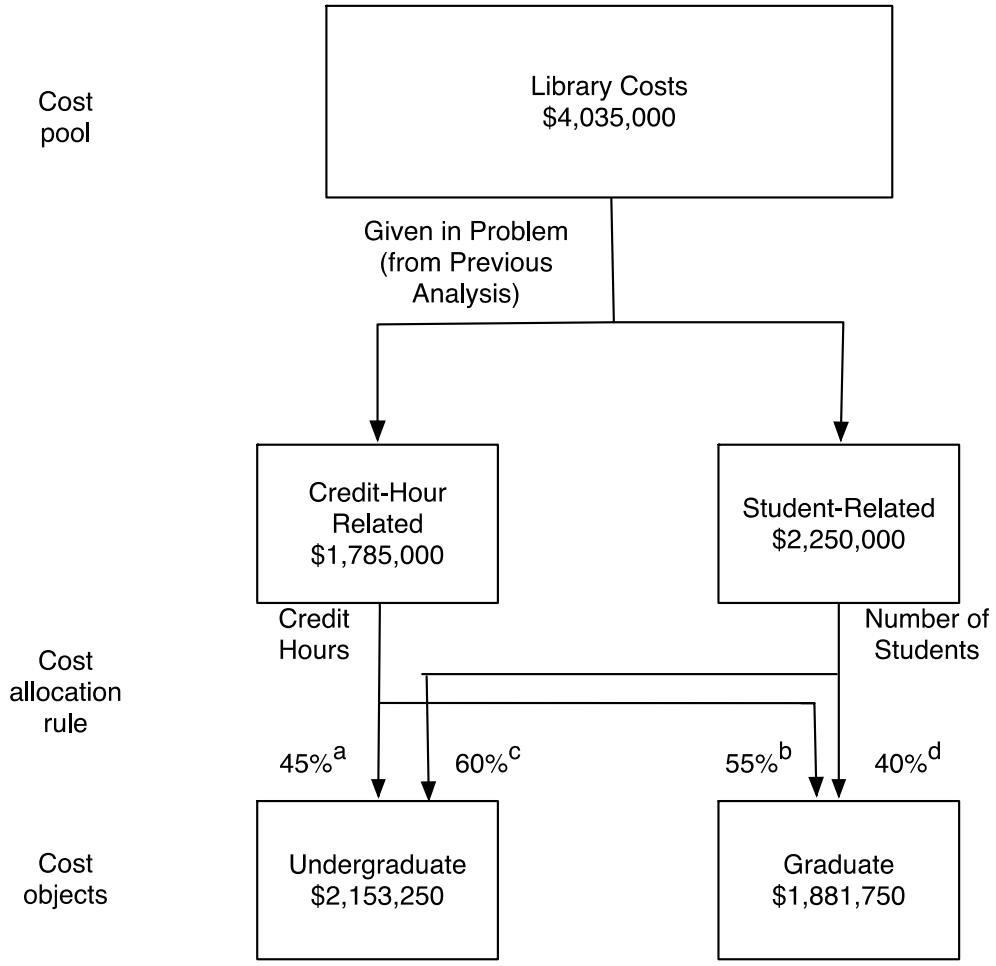
	Undergraduate	Graduate	Total
Number of students	900	600	1,500
Percentage	60%	40%	100%
Credit Hours	13,500	16,500	30,000
Percentage	45%	55%	100%
Allocation of student-related costs[a]	$1,350,000	$900,000	$2,250,000
Allocation of credit-hour costs[b]	803,250	981,750	1,785,000
Total Allocations	$2,153,250	$1,881,750	$4,035,000

[a] $1,350,000 = 60% x $2,250,000; $900,000 = 40% x $2,250,000.

[b] $803,250 = 45% x $1,785,000; $981,750 = 55% x $1,785,000.

2-58. (continued)

b.



a 45% = 13,500 credit hours ÷ (13,500 credit hours + 16,500 credit hours)
b 55% = 16,500 students ÷ (13,500 credit hours + 16,500 credit hours)
c 60% = 900 students ÷ (900 students + 600 students)
d 40% = 600 students ÷ (900 students + 600 students)

2-59. (40 Min.) Find the Unknown Information.

a.

Finished goods beginning inventory	+	Cost of goods manufactured	–	Cost of goods sold	=	Finished goods ending inventory
Finished goods beginning inventory	+	$88,800	–	$87,040	=	$14,080
Finished goods beginning inventory	=	$ 12,320	(= $14,080 – $88,800 + $87,040)			

b.

Direct materials used	+	Direct labor	+	Manufacturing overhead	=	Total manufacturing costs
Direct materials used	+	$ 12,160	+	$23,040	=	$77,600
Direct materials used	=	$42,400	(= $77,600 – $12,160 – $23,040)			

Alternative solution

Direct materials used	=	Beginning inventory	+	Materials purchased	–	Ending inventory
Direct materials used	=	$16,000	+	$38,400	–	$12,000
Direct materials used	=	$42,400				

c.

Sales revenue	–	Cost of goods sold	=	Gross margin
Sales revenue	–	$87,040	=	$52,480

Rearranging,

Sales revenue = $139,520 (= $52,480 + $87,040)

Gross margin % = $52,480 ÷ $139,520 = 37.6%

2-60. (40 Min.) Find the Unknown Information.

a.

Cost of goods sold	=	Finished goods beginning inventory	+	Cost of goods manufactured	–	Finished goods ending inventory
	=	$22,320	+	$598,400	–	$25,520
Cost of goods sold	=	$595,200				

b.

Total manufacturing costs	=	Direct materials used	+	Direct labor	+	Manufacturing overhead
$612,320	=	Direct materials used	+	$270,400	+	$225,000

Direct materials used = $116,920 (= $612,320 – $270,400 – $225,000)

c.

Direct materials used	=	Beginning inventory	+	Materials purchased	–	Ending inventory
$116,920	=	$2,520	+	Materials purchased	–	$2,088

Materials purchased = $116,488 (= 116,920 – $2,520 + $2,088)

d.

Gross margin % = Gross margin ÷ Sales revenue

38% = (Sales revenue – Cost of goods sold) ÷ Sales revenue

38% x Sales revenue = Sales revenue – Cost of goods sold

Cost of goods sold = Sales revenue – (38% x Sales revenue)

Cost of goods sold = Sales revenue x (1 – 38%)

Sales revenue = Cost of goods sold ÷ (100% – 38%)

= $595,200 (from a) ÷ 62%

$960,000

2-61. (40 min.) Cost Allocation and Regulated Prices: The City of Imperial Falls.

a. The rate is 20 percent above the average cost of collection:

Total cost of collection	**=**	**$400,000 + $1,280,000 + $320,000**
	=	**$2,000,000**
Total waste collected (tons)	**=**	**4,000 + 12,000**
	=	**16,000 tons**
	=	**32,000,000 pounds**
Average cost per pound	**=**	**$2,000,000 ÷ 32,000,000 pounds**
	=	**$.0625 per pound**
Price per pound	**=**	**$.0625 x 1.20**
	=	**$.075 per pound**

b.

First, allocate costs to the two cost objects: households and businesses:

Allocation of administrative costs and truck costs:

Total costs	**=**	**$400,000 + $1,280,000**
	=	**$1,680,000**
Number of customers	**=**	**12,000 + 3,000**
	=	**15,000 customers**
Allocated cost per customer	**=**	**$1,680,000 ÷ 15,000 customers**
	=	**$112 per customer**

Allocation of other collection costs:

Total costs	**=**	**$320,000**
Total waste collected (tons)	**=**	**4,000 + 12,000**
	=	**16,000 tons**
Allocated cost per ton of waste	**=**	**$320,000 ÷ 16,000 tons**
	=	**$20 per ton**

2-61. (continued)

Allocation to customer types:

	Households	Business
Allocation of customer cost:		
Allocated cost per customer	**$112**	**$112**
Number of customers	**12,000**	**3,000**
Allocated cost	**$1,344,000**	**$336,000**
Allocation of other costs:		
Allocated cost per ton	**$20**	**$20**
Number of tons	**4,000**	**12,000**
Allocated cost	**$80,000**	**$240,000**
Total allocated cost	**$1,424,000**	**$576,000**
Total number of tons	**4,000**	**12,000**
Number of pounds	**8,000,000**	**24,000,000**
Average allocated cost per pound	**$.1780**	**$.0240**
Price (= 1.20 x average cost)	**$.2136**	**$.0288**

c. Answers will vary. This problem illustrates that cost allocation can have an important effect on decisions when the allocated costs are used as if they are actual costs. In the current example, the proposed allocation approach allows the company to compete with other haulers for business customers because they maintain a monopoly on the household business.

2-62. (30 min.) Reconstruct Financial Statements: San Ysidro Company.

	A	B	C	D	E	F	G
1	SAN YSIDRO COMPANY						
2	Cost of Goods Manufactured and Sold Statement						
3	For the Year Ending December 31						
4							
5	Work in process, January 1					$ 72,520	
6	Manufacturing costs:						
7	Direct materials:						
8	Direct materials inventory, January 1	$ 309,880	a				
9	Direct materials purchased	1,008,000					
10	Direct materials available for use	$ 1,317,880					
11	Less materials inventory, December 31	248,000					
12	Materials used			$ 1,069,880			
13	Direct labor			1,120,000	b		
14	Manufacturing overhead:						
15	Indirect labor	89,600	b				
16	Plant utilities	104,160					
17	Building depreciation	181,440					
18	Other plant costs	82,160					
19	Maintenance on plant machinery	33,880					
20	Insurance on plant machinery	53,200					
21	Taxes on manufacturing property	38,800					
22	Total overhead			583,240			
23	Total manufacturing costs					2,773,120	
24	Total cost of work in process during the year					$ 2,845,640	
25	Less work in process, December 31					68,880	
26	Cost of goods manufactured this year					$ 2,776,760	
27	Add finished goods, January 1					224,000	
28	Cost of goods available for sale					$ 3,000,760	
29	Less finished goods, December 31					252,000	
30	Cost of goods sold (to income statement)					$ 2,748,760	
31							

[a]Materials used is given, but this number is not. To obtain it,
Beg. Bal. + Purchases = Mat. Used + End. Bal.
Beg. Bal. = Mat. Used + End. Bal. – Purchases
$309,880 = $1,069,880 + $248,000 – $1,008,000

[b]Total labor = Indirect labor + Direct labor = $1,209,600 = 0.08 Direct labor + Direct labor
Direct labor = $1,209,600 ÷ 1.08 = $1,120,000
Indirect labor = 0.08 x $1,120,000 = $89,600

2-62 (continued)

	A	B	C	D
1	SAN YSIDRO COMPANY			
2	Income Statement			
3	For the Year Ending December 31			
4	Sales revenue			$ 4,550,000
5	Less: Cost of goods sold (per statement)			2,748,760
6	Gross margin			$ 1,801,240
7	Building depreciation	$ 45,360	a	
8	Administrative salaries	192,000		
9	Marketing costs	103,600		
10	Distribution costs	4,480		
11	Attorney fees	22,960		
12	Total operating costs			368,400
13	Operating profit			$ 1,432,840
14				

[a] Total depreciation = Depreciation on plant + Depreciation on administrative building portion

Depreciation on plant is 80% of the total depreciation, so total depreciation is,

= $181,440 ÷ 0.80

= $226,800

Depreciation on administrative portion = $226,800 x (1.0 – 0.8)

= $45,360.

2-63. **(20 Min.) Finding Unknowns: Mary's Mugs**.

a. $2,812.50.

Direct materials cost per unit = Direct materials cost ÷ Units produced

= $6,000 ÷ 20,000 units = $0.30 per unit.

Direct materials used per mug = 0.4 pounds.

Direct materials cost per pound = $0.30 ÷ 0.4 pounds = $0.75 per pound.

Direct materials inventory = 3,750 pounds × $0.75 per pound = $2,812.50.

b. 2,750 units.

Finished goods inventory (in units)

= Finished goods inventory ÷ Manufacturing cost per unit.

Manufacturing cost per unit

= (Direct material + Direct labor + Indirect manufacturing cost) ÷ Units produced

= ($6,000 + $27,000 + $5,400 + $6,000) ÷ 20,000 = $44,400 ÷ 20,000

= $2.22 per unit.

Finished goods inventory (in units) December 31, Year 1 = $6,105 ÷ $2.22

= 2,750 units

c. $4.25.

Selling price per unit = Sales revenue ÷ Units sold

= Sales revenue ÷ (Units produced – units in ending finished goods inventory)

= $73,312 ÷ (20,000 – 2,750) = $73,312 ÷ 17,250 = $4.25.

d. $13,642.

Operating income for the year:

Sales revenue		**$ 73,312**
Cost of goods sold (17,250 x $2.22)		**38,295**
Gross margin		**$ 35,017**
Less marketing and administrative costs		
Variable marketing and administrative costs	**$3,375**	
Fixed marketing and administrative costs	**18,000**	**21,375**

Operating profit ..... $ 13,642

2-64. (40 Min.) Finding Unknowns: BS&T Partners.

Note: This problem is challenging, because there is no indication of how to begin or the order in which to solve for the unknowns.

	A	B	C	D
1	Direct labor cost per unit	$6.25		
2	Direct labor hours worked, August	3,000	hours	(f)
3	Direct labor wage rate per hour	$20.00		
4	Direct materials cost per unit	$5.00		
5	Direct materials cost per pound of material	$10.00		
6	Direct materials inventory (cost), August 31	$3,500		
7	Direct materials inventory (units), August 31	350	pounds	(a)
8	Finished goods inventory (cost), August 31	$10,800		
9	Finished goods inventory (units), August 31	400	units	(b)
10	Manufacturing overhead cost per unit	$15.75		
11	Operating profit, August	$55,200		
12	Production (units), August	9,600	units	(e)
13	Sales revenues, August	$414,000		
14	Sales (units), August	9,200	units	(c)
15	Selling price per unit	$45		(d)
16	Selling, general, and administrative costs per unit	$12.00		
17				

We begin by computing the following unit costs:

Manufacturing cost per unit = Direct materials + Direct labor + Manufacturing overhead
= $5.00 + $6.25 + $15.75 = $27.00

Full cost per unit = Manufacturing cost per unit + Selling, general & administrative
= $27.00 + $12.00 = $39.00

a. Direct material inventory (pounds) = Direct material inventory (cost) ÷ Cost per pound
= $3,500 ÷ $10.00 = 350 pounds.

b. Finished goods inventory, cost = (Finished goods inventory, units) ÷ (Manufacturing cost per unit)
= $10,800 ÷ $27 = 400 units

2-64 (continued)

c. Full costs = Cost of goods sold + Selling, general, and administrative costs

Then,

Operating profit = Sales revenue – Cost of goods sold – Selling, general, and administrative costs

= Sales revenue – Full costs

$55,200 = $414,000 – Full costs

Full costs = $414,000 — $55,200 = $358,800

Full costs = Units sold x Full cost per unit

$358,800 = Units sold x $39.00

Units sold = $358,800 ÷ $39.00

= 9,200 units sold

d. Sales revenue = Selling price per unit x Units sold

$414,000 = Selling price per unit x 9,200 units sold

Selling price per unit = $414,000 ÷ 9,200

= $45.00

e. Finished goods ending (units) = Finished goods beginning (units) + Units produced – Units sold

400 = 0 + Units produced — 9,200

Units produced = 9,200 + 400 = 9,600

f. Direct labor cost incurred = Direct-labor hours worked x Wage rate per hour

Direct labor cost incurred = Units produced x Direct labor cost per unit

= 9,600 x $6.25 = $60,000

$60,000 = Direct-labor hours worked x $20.00

Direct-labor hours worked = $60,000 ÷ $20.00

= 3,000 direct-labor hours

Solutions to Integrative Case

2-65. (30 min.) Analyze the Impact of a Decision on Income Statements: Tunes2Go.

a. This year's income statement:

	Baseline (Status Quo)	Rent Equipment	Difference	
Sales revenue	$4,800,000	$4,800,000	0	
Operating costs:				
Variable	(600,000)	(600,000)	0	
Fixed (cash expenditures)	(2,250,000)	(2,250,000)	0	
Equipment depreciation	(450,000)	(450,000)	0	
Other depreciation	(375,000)	(375,000)	0	
Loss from equipment write-off	0	(2,550,000) [a]	$2,550,000	lower
Operating profit (before taxes)	$1,125,000	$ (1,425,000)	$2,550,000	lower

[a] Equipment write-off = $3 million cost – $450,000 accumulated depreciation for one year (equipment was purchased on January 1 of the year).

b. Next year's income statement:

	Baseline (Status Quo)	Rent Equipment	Difference	
Sales revenue	$4,800,000	$5,136,000 [a]	$336,000	higher
Operating costs:				
Equipment rental	0	(690,000)	690,000	higher
Variable	(600,000)	(600,000)	0	
Fixed cash expenditures	(2,250,000)	(2,115,000) [b]	135,000	lower
Equipment depreciation	(450,000)	0	450,000	lower
Other depreciation	(375,000)	(375,000)	0	
Operating profit	$1,125,000	$1,356,000	$231,000	higher

[a] $5,136,000 = 1.07 × $4,800,000
[b] $2,115,000 = (1.00 – 0.06) × $2,250,000

c. Despite the effect on next year's income statement, the company should not rent the new machine because net cash inflow as a result of installing the new machine ($336,000 + $135,000) does not cover cash outflow for equipment rental ($690,000).