Managerial Accounting Tools for Business Decision-Making (Canadian) 5th edition Weygandt Solutions Manual

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CHAPTER 2

ASSIGNMENT CLASSIFICATION TABLE

Study Objectives	Self-Study Questions	Brief Exercises	Do It! Review	Exercises	Problems
1. Define the three classes of manufacturing costs and differentiate between product and period costs.	5, 6, 7, 8	1, 2, 3, 9, 11	14	18, 19, 20, 21, 22, 29, 35	40A, 41A, 45A, 48A, 49B, 50B, 53B,
2. Explain variable, fixed, and mixed costs and the relevant range.	1, 2	4, 5	15	23, 24, 26, 28	47A, 55B
3. Apply the high-low method to determine the components of mixed costs.	3, 4	4, 6, 7, 8	16	25, 27	
4. Demonstrate how to calculate cost of goods manufactured and prepare financial statements for a manufacturer.	9, 10	10, 12, 13	17	30, 31, 32, 33, 34, 35, 36, 37, 38, 39	42A, 43A, 44A, 45A, 46A, 48A, 51B, 52B, 53B, 54B, 56B, 57B, 58B

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ASSIGNMENT CHARACTERISTICS TABLE

Problem Number	Description	Difficulty Level	Time Allotted (min.)
40A	Classify manufacturing costs into different categories and calculate the unit cost.	Simple	20–30
41A	Classify manufacturing costs into different categories and calculate the unit cost.	Simple	20–30
42A	Indicate the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule, an income statement, and a partial balance sheet.	Moderate	30–40
43A	Prepare a cost of goods manufactured schedule, a partial income statement, and a partial balance sheet.	Moderate	30–40
44A	Prepare a cost of goods manufactured schedule and a correct income statement.	Moderate	30–40
45A	Calculate cost of goods manufactured, and cost of goods sold.	Moderate	20–30
46A	Calculate raw materials purchased, cost of goods manufactured, and cost of goods sold.	Moderate	20–30
47A	Determine missing amounts in the cost of goods manufactured and sold schedule and compare fixed and variable costs.	Challenging	30–40
48A	Determine missing amounts and calculate selected costs for schedules of cost of goods manufactured and sold.	Challenging	30–40
49B	Classify manufacturing costs into different categories and calculate the unit cost.	Simple	20–30
50B	Classify manufacturing costs into different categories and calculate the unit cost.	Simple	20–30
51B	Indicate the missing amount of different cost items, and prepare a condensed cost of goods manufactured schedule, an income statement, and a partial balance sheet.	Moderate	30–40
52B	Prepare a cost of goods manufactured schedule, a partial income statement, and a partial balance sheet.	Moderate	30–40

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ASSIGNMENT CHARACTERISTICS TABLE (Continued)

Problem Number	Description	Difficulty Level	Time Allotted (min.)
53B	Calculate prime cost, conversion cost and cost of goods manufactured.	Moderate	20–30
54B	Prepare income statement schedules for cost of goods sold and cost of goods manufactured.	Moderate	30–40
55B	Determine missing amounts in the cost of goods manufactured and sold schedule and compare fixed and variable costs.	Challenging	20–30
56B	Prepare a cost of goods manufactured schedule and a correct income statement.	Moderate	30–40
57B	Calculate selected costs for the income statement, and schedules of cost of goods manufactured and sold.	Moderate	20–30
58B	Determine missing amounts, prepare cost of goods manufactured and calculate inventory values.	Challenging	40–50

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Correlation Chart between Bloom's Taxonomy, Study Objectives and End-of-Chapter Exercises and Problems

Study Objective	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
1. Define the three classes of manufacturing costs and differentiate between product and period costs.	D14	BE1, BE2, BE3, BE9, BE11,E18, E19, E20, E21, E22	E29, E35, P53B	P40A, P41A, P45A, P48A, P49B, P50B		
2. Explain variable, fixed, and mixed costs and the relevant range. .		BE4, D15, E23, E26	BE5, E28	E24	P47A, P55B	
3. Apply the high-low method to determine the components of mixed costs.		BE4	BE6, D16, E25, E27	BE7, BE8		
4. Demonstrate how to calculate cost of goods manufactured and prepare financial statements for a manufacturer.	E37	BE10	BE12, BE13, D17, E30, E31, E34, E35, E36, E38, E39, P43A, P52B, P53B, P56B	P45A, P46A, P48A, P54B, P57B	E32, E33, P42A, P44A, P51B, P58B	

A note about the correlation between CPA competencies and the end-of-chapter exercises and problems.

The CPA competencies are divided into enabling competencies and terminal competencies. Unless otherwise specified, the terminal competency being tested by the end-of-chapter material in this course is cpa-t003 (Management Accounting). The enabling competency being tested will differ between questions. The following questions test enabling competency cpa-e002 Problem-Solving and Decision-Making:

BE2.5, BE2.6, BE2.7, BE2.8, BE2.11, BE2.12, BE2.13, D2.16, D2.17, E2.20, E2.24, E2.25, E2.27, E2.28, E2.29, E2.30, E2.31, E2.32, E2.33, E2.34, E2.35, E2.36, E2.38, E2.39, P2.40A, P2.41A, P2.42A, P2.43A, P2.44A, P2.45A, P2.46A, P2.47A, P2.48A, P2.49B, P2.50B, P2.51B, P2.52B, P2.53B, P2.54B, P2.55B, P2.56B, P2.57B, P2.58B

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SOLUTIONS TO BRIEF EXERCISES

BRIEF EXERCISE 2.1

(a) DM Frames and tires used in manufacturing bicycles
(b) DL Wages paid to production workers
(c) MO Insurance on factory equipment and machinery
(d) MO Depreciation on factory equipment

BRIEF EXERCISE 2.2

(a) Direct materials
(b) Direct materials
(c) Direct labour
(d) Manufacturing overhead
(e) Manufacturing overhead (Indirect materials)
(f) Direct materials
(g) Direct materials
(h) Manufacturing overhead (Indirect labour)

BRIEF EXERCISE 2.3

(a) Product
(b) Period
(c) Period
(d) Product
(e) Period
(f) Product

BRIEF EXERCISE 2.4

Indirect labour is a variable cost because it increases in total directly and proportionately with the change in the activity level: $10,000 ÷ 2,000 units = $5 and $20,000 ÷ 4,000 units = $5.

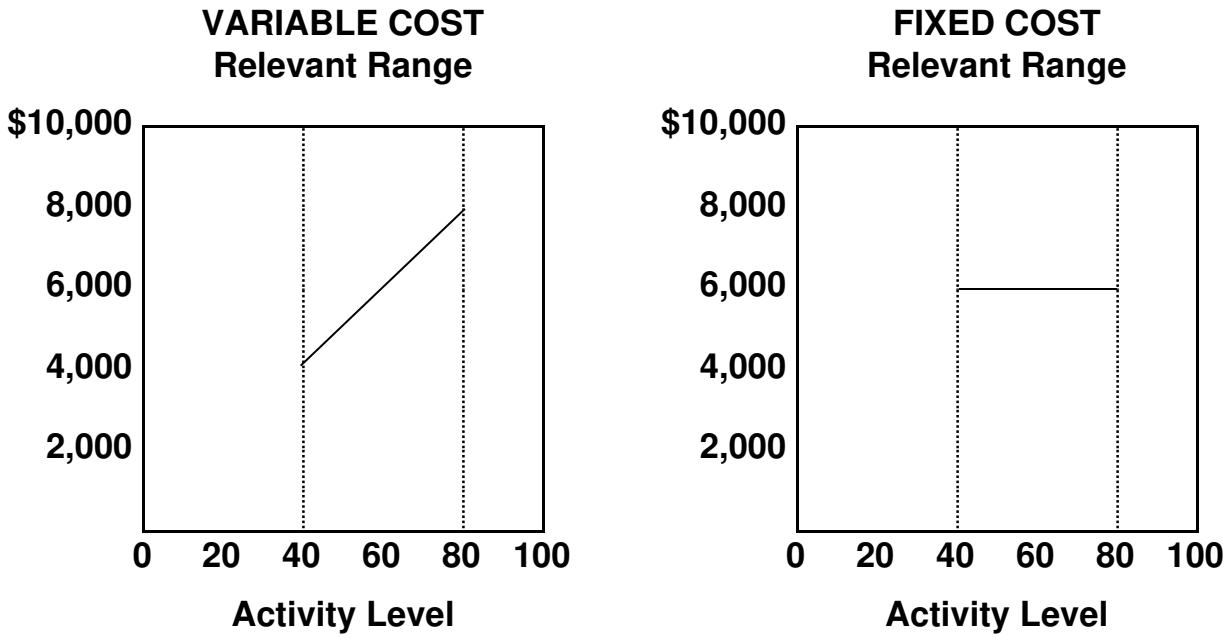
Supervisory salaries are a fixed cost because they remain the same in total regardless of changes in the activity level: $5,000 at both levels.

Maintenance is a mixed cost because it increases in total but not proportionately with changes in the activity level: $4,000 ÷ 2,000 units = $2 and $7,000 ÷ 4,000 units = $1.75.

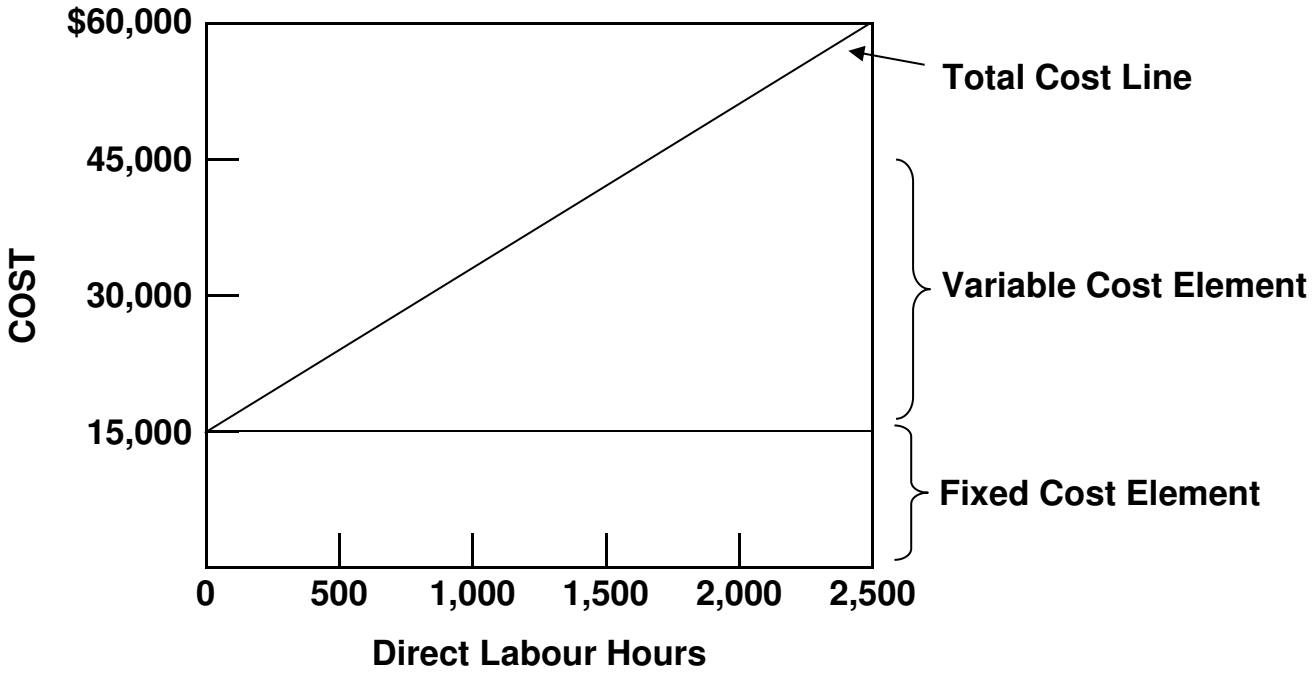
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BRIEF EXERCISE 2.5



BRIEF EXERCISE 2.6



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BRIEF EXERCISE 2.7

High		Low		Difference
$16,490	–	$12,330	=	$4,160
8,200	–	5,000	=	3,200

$4,160 ÷ 3,200 = $1.30—Variable cost per kilometre

	High	Low
Total cost	$16,490	$12,330
Less: Variable costs		
8,200 × $1.30	10,660	
5,000 × $1.30		6,500
Total fixed costs	$5,830	$5,830

The mixed cost is $5,830 plus $1.30 per kilometre.

BRIEF EXERCISE 2.8

High		Low		Difference
$65,000	–	$32,000	=	$33,000
40,000	–	18,000	=	22,000

$33,000 ÷ 22,000 = $1.50 per unit

	Activity Level	
	High	Low
Total cost	$65,000	$32,000
Less: Variable costs		
40,000 × $1.50	60,000	
18,000 × $1.50		27,000
Total fixed costs	$ 5,000	$ 5,000

The mixed cost is $5,000 plus $1.50 per unit produced.

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BRIEF EXERCISE 2.9

	Product Costs		
	Direct Materials	Direct Labour	Factory Overhead
(a)			X
(b)	X		
(c)			X
(d)		X	

BRIEF EXERCISE 2.10

DIEKER COMPANY
Balance Sheet Partial)
December 31, 2020

Current assets	
Cash	$62,000
Accounts receivable	200,000
Inventories	
Finished goods	$71,000
Work in process	87,000
Raw materials	73,000
	231,000
Prepaid expenses	38,000
Total current assets	$531,000

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BRIEF EXERCISE 2.11

(a) Direct labour costs = prime costs + conversion costs – total manufacturing costs
Direct labour = $195,000 + $140,000 – $270,000 = $65,000

Direct material costs = prime costs – direct labour costs
Direct material costs = $195,000 – $65,000 = $130,000

Manufacturing overhead costs = conversion costs – direct labour costs
Manufacturing overhead costs = $140,000 – $65,000 = $75,000

(b) Total costs of production = direct material + direct labour + overhead
= $130,000 + $65,000 + $75,000 = $270,000

(c) Total period costs = $200,000

BRIEF EXERCISE 2.12

	Direct Materials Used	Direct Labour Used	Factory Overhead	Total Manufacturing Costs
(1)				$136,000[1]
(2)	$81,000[2]			
(3)		$144,000[3]		

(1) $25,000 + $61,000 + $50,000
(2) $296,000 – $140,000 – $75,000
(3) $310,000 – $111,000 – $55,000

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BRIEF EXERCISE 2.13

	Total Manufacturing Costs	Work in Process (1/1)	Work in Process (12/31)	Cost of Goods Manufactured
(1)	$136,000			$174,000[1]
(2)		$123,000[2]		
(3)			$58,000[3]	

[1] $120,000 + $136,000 – $82,000 = $174,000
[2] $321,000 – $296,000 + $98,000 = $123,000
[3] $310,000 + $463,000 - $715,000 = $58,000

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SOLUTIONS TO *DO IT!* REVIEW EXERCISES

*DO IT! 2.*14

Period costs:
Advertising
Salaries of sales representatives

Product costs:
Blank CDs (DM)
Depreciation of CD image burner (MO)
Salary of factory manager (MO)
Factory supplies used (MO)
Paper inserts for CD cases (DM)
CD plastic cases (DM)
Salaries of factory maintenance employees (MO)
Salaries of employees who burn music onto CDs (DL)

*DO IT! 2.*15

Variable costs: Indirect labour, direct labour, and direct materials
Fixed costs: Property taxes and depreciation
Mixed costs: Utilities and maintenance

*DO IT! 2.*16

(a) Variable cost: ($18,750 – $16,200) ÷ (10,500 – 8,800) = $1.50 per unit
Fixed cost: $18,750 – ($1.50 × 10,500 units) = $3,000
or $16,200 – ($1.50 × 8,800 units) = $3,000

(b) Total estimated cost to produce 8,500 units:
= $3,000 + ($1.50 × 8,500) = $15,750

Total estimated cost cannot be calculated because 8,500 units are out of the relevant range of 8,800 to 10,500 units.

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DO IT! 2.17

ROLEN MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Month Ended April 30

Work in process, April 1		$5,000
Direct materials		
Raw materials, April 1	$10,000	
Raw materials purchases	98,000	
Total raw materials available for use	108,000	
Less: Raw materials, April 30	14,000	
Direct materials used	$94,000	
Direct labour	60,000	
Manufacturing overhead	180,000	
Total manufacturing costs	334,000	
Total cost of work in process		339,000
Less: Work in process, April 30		3,500
Cost of goods manufactured		$335,500

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SOLUTIONS TO EXERCISES

EXERCISE 2.18

1. (c) Manufacturing overhead (indirect labour)
2. (c) Manufacturing overhead
3. (c) Manufacturing overhead
4. (c) Manufacturing overhead
5. (a) Direct materials
6. (b) Direct labour
7. (c) Manufacturing overhead
8. (c) Manufacturing overhead (Indirect materials)
9. (c) Manufacturing overhead (Indirect labour)
10. (a) Direct materials

EXERCISE 2.19

(a)

Materials used in product….DM	Advertising expense..... Period
Depreciation on plant…….MOH	Property taxes on plant.....MOH
Property taxes on store……Period	Delivery expense ..... Period
Labour costs of assembly-line workers……DL	Sales commissions ..... Period
Factory supplies used……MOH	Salaries paid to sales clerks ... Period

(b) Product costs are recorded as a part of the cost of inventory, because they are an integral part of the cost of producing the product. Product costs are not expensed until the goods are sold and are reflected in the cost of goods sold account. Period costs are recognized as an expense when incurred.

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EXERCISE 2.20

(a)	Factory utilities	$ 15,500
	Depreciation on factory equipment	12,650
	Indirect factory labour	48,900
	Indirect materials	80,800
	Factory manager's salary	8,000
	Property taxes on factory building	2,500
	Factory repairs	2,000
	Manufacturing overhead	$170,350
(b)	Direct materials used	$137,600
	Direct labour	69,100
	Manufacturing overhead	170,350
	Product costs	$377,050
(c)	Depreciation on delivery trucks	$ 3,800
	Sales salaries	46,400
	Repairs to office equipment	1,300
	Advertising	15,000
	Office supplies used	2,640
	Period costs	$69,140

EXERCISE 2.21

1.	(c)	3.	(a)	5.	(b)*	7.	(a)	9.	(c)
2.	(c)	4.	(c)	6.	(d)	8.	(b)	10.	(c)

*or sometimes (c), depending on the circumstances

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EXERCISE 2.22

1. (b)
2. (c)
3. (a)
4. (c)
5. (c)
6. (c)
7. (c)
8. (c)
9. (c)
10. (c)

EXERCISE 2.23

(a)

Variable costs	**Vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis**
Fixed costs	**Remain constant in total regardless of changes in the activity level but vary on a per-unit basis**
Mixed costs	**Contain both a variable and fixed cost element. They change in total but not proportionately with changes in the activity level and vary both in total and on a per-unit basis**

(b) Using these criteria as a guideline, the classification is as follows:

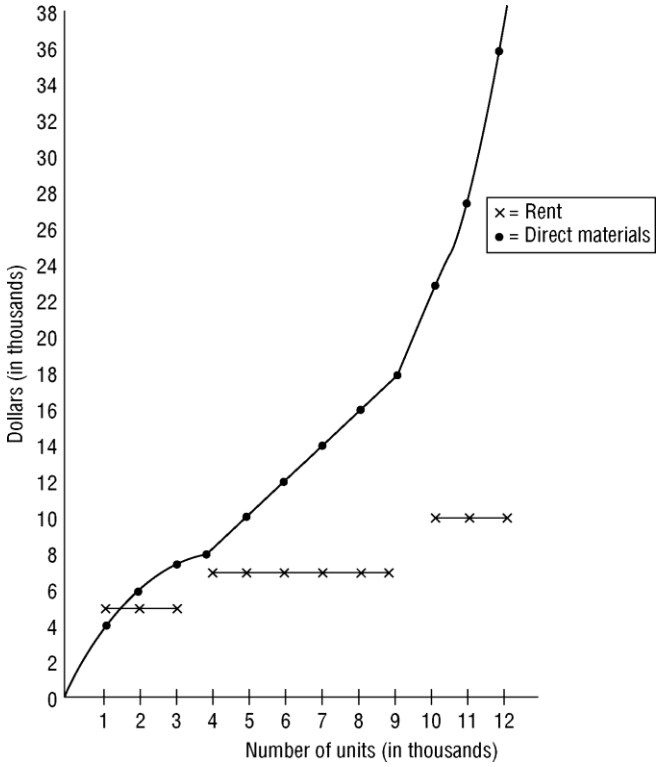
Direct materials	**Variable**	**Rent**	**Fixed**
Direct labour	**Variable**	**Maintenance**	**Mixed**
Utilities	**Mixed**	**Supervisory salaries**	**Fixed**

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EXERCISE 2.24

(a)



(b) The relevant range is 4,000 – 9,000 units of output since a straight-line relationship exists for both direct materials and rent within this range.

(c) Variable cost per unit within the relevant range: (4,000 – 9,000 units)

$$= \frac{\text{Cost}}{\text{Units}}$$

$$= \frac{\$10{,}000^*}{5{,}000^*} = \$2 \text{ per unit}$$

***Any costs and units within the relevant range could have been used to calculate the same unit cost of $2.**

(d) Fixed cost within the relevant range (4,000 to 9,000 units) = $7,000.

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EXERCISE 2.25

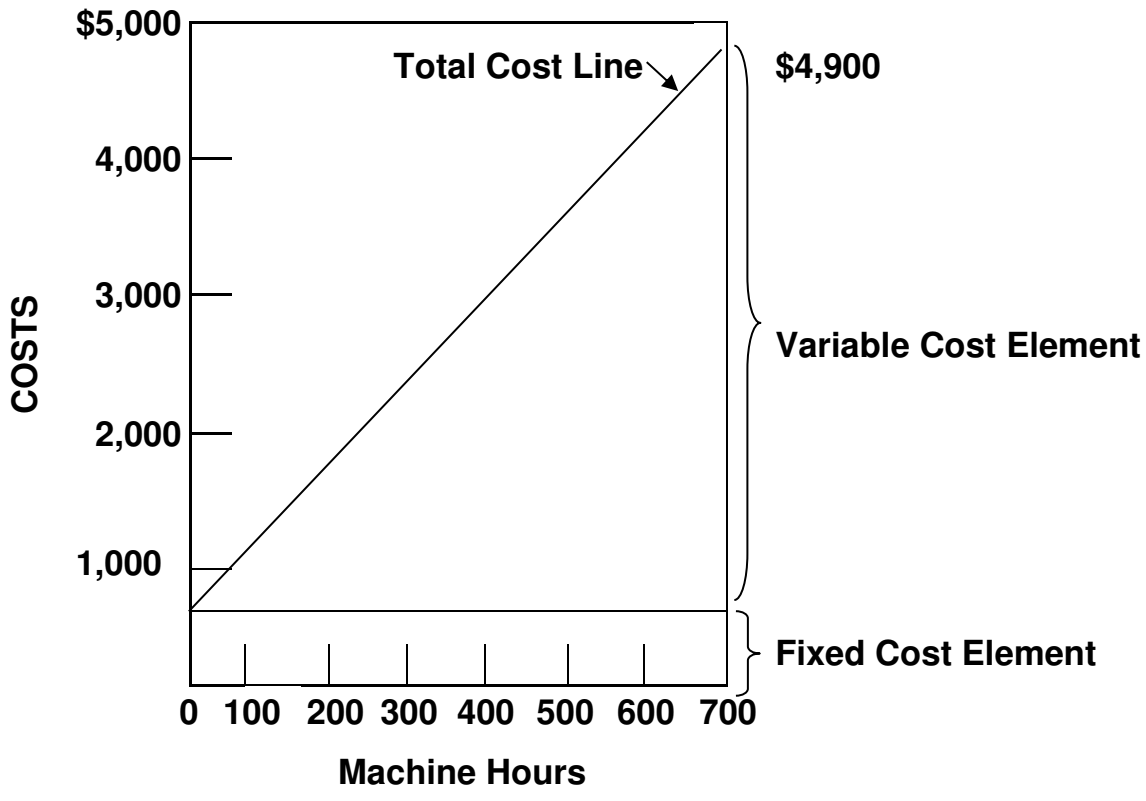
(a) Maintenance Costs:

($4,900 – $2,500) ÷ (700 – 300) = $2,400 ÷ 400 =
$6.00 variable cost per machine hour

	700 Machine Hours	300 Machine Hours
Total costs	$4,900	$2,500
Less: Variable costs		
700 × $6.00	4,200	
300 × $6.00		1,800
Total fixed costs	$ 700	$ 700

Thus, maintenance costs are $700 per month plus $6.00 per machine hour.

(b)



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EXERCISE 2.26

1.	Wood used in the production of furniture	Variable
2.	Fuel used in delivery trucks	Variable
3.	Straight-line depreciation on factory building	Fixed
4.	Screws used in the production of furniture	Variable
5.	Sales staff salaries	Fixed
6.	Sales commissions	Variable
7.	Property taxes	Fixed
8.	Insurance on buildings	Fixed
9.	Hourly wages of furniture craftspeople	Variable
10.	Salaries of factory supervisors	Fixed
11.	Utilities expense	Mixed
12.	Telephone bill	Mixed

EXERCISE 2.27

(a) Maintenance Costs:

$$\frac{\$5{,}000 - \$2{,}750}{8{,}000 - 3{,}500} = \frac{\$2{,}250}{4{,}500}$$

= $0.50 variable cost per machine hour

	Activity Level	
	High	Low
Total cost	$5,000	$2,750
Less: Variable costs		
8,000 × $.50	4,000	
3,500 × $.50		1,750
Total fixed costs	$1,000	$1,000

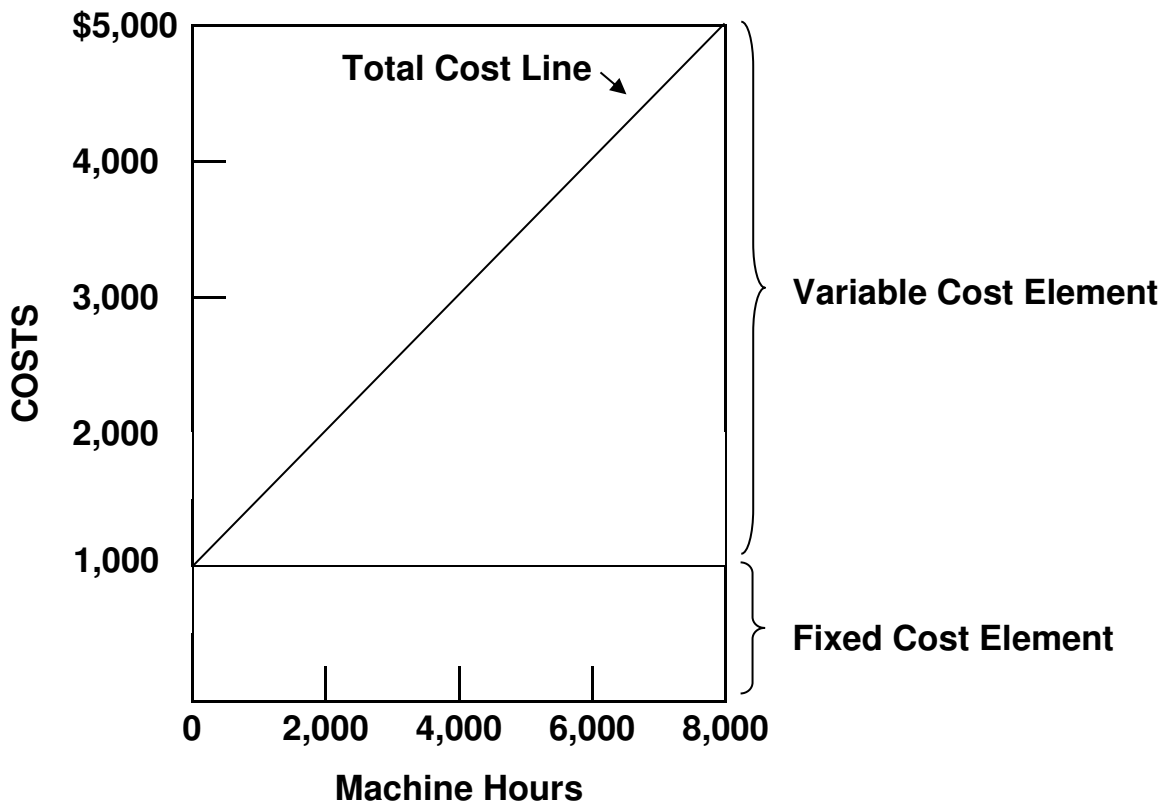
Thus, maintenance costs are $1,000 per month plus $0.50 per machine hour.

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EXERCISE 2.27 (Continued)

(b)



EXERCISE 2.28

(a)

Cost	Fixed	Variable	Mixed
Direct materials		X	
Direct labour		X	
Utilities			X
Property taxes	X		
Indirect labour		X	
Supervisory salaries	X		
Maintenance			X
Depreciation	X		

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EXERCISE 2.28 (Continued)

(b) Variable costs to produce 3,000 units = $7,500 + $15,000 + $4,500
= $27,000

Variable cost per unit = $27,000 ÷ 3,000 units
= $9 per unit

Variable cost portion of mixed cost = Total cost – Fixed portion

Utilities:
Variable cost to produce 3,000 units = $1,800 – $300
= $1,500

Variable cost per unit = $1,500 ÷ 3,000 units
= $0.50 per unit

Maintenance:
Variable cost to produce 3,000 units = $1,100 – $200
= $900

Variable cost per unit = $900 ÷ 3,000 units
= $0.30 per unit

Total variable cost per unit = $9.00 + $0.50 + $0.30
= $9.80

Fixed cost element = $1,000 + $1,800 + $2,400 +
$300 + $200
= $5,700

Cost to produce 5,000 units = ($9.80 × 5,000) + $5,700
= $49,000 + $5,700
= $54,700

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EXERCISE 2.29

(a)	**Delivery service (product) costs:**	
	Indirect materials	$ 8,400
	Depreciation on delivery equipment	11,200
	Dispatcher's salary	7,000
	Gas and oil for delivery trucks	2,200
	Drivers' salaries	15,000
	Delivery equipment repairs	300
	Total	$44,100
(b)	**Period costs:**	
	Property taxes on office building	$ 2,870
	CEO's salary	22,000
	Advertising	1,600
	Office supplies	650
	Office utilities	990
	Repairs on office equipment	680
	Total	$28,790

EXERCISE 2.30

(a)	**Work-in-process, 1/1**		$ 10,000
	Manufacturing costs:		
	Direct materials used		$120,000
	Direct labour		110,000
	Manufacturing overhead		
	Depreciation on plant	$60,000	
	Factory supplies used	25,000	
	Property taxes on plant	19,000	
		104,000	
	Total cost of work-in-process		344,000
	Less: ending work-in-process		14,000
	Cost of goods manufactured		$330,000
(b)	**Finished goods, 1/1**		$ 60,000
	Cost of goods manufactured		330,000
	Cost of goods available for sale		390,000
	Finished goods, 12/31		50,600
	Cost of goods sold		$339,400

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EXERCISE 2.31

CEPEDA MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31

Work in process inventory (1/1).....		$210,000
Direct materials		
Raw materials inventory, (1/1) [2].....	$42,500	
Raw materials purchases	165,000	
Total raw materials available for use [1] ..	207,500	
Less: Raw materials inventory (12/31).....	17,500	
Direct materials used		190,000
Direct labour [5]		111,000
Manufacturing overhead		
Indirect labour	$15,000	
Factory depreciation.....	36,000	
Factory utilities.....	68,000	
Total manufacturing overhead.....		119,000
Total manufacturing costs [4]		420,000
Total cost of work in process [3].....		630,000
Less: Work in process inventory (12/31)		80,000
Cost of goods manufactured		$550,000

Calculations:

[1] Total raw materials available for use:

Direct materials used	$190,000
Add: Raw materials inventory (12/31)	17,500
Total raw materials available for use	$207,500

[2] Raw materials inventory (1/1):

Raw materials available for use (from [1]).....	$207,500
Less: Raw materials purchases.....	165,000
Raw materials inventory (1/1)	$ 42,500

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EXERCISE 2.31 (continued)

(3) Total cost of work in process:

Cost of goods manufactured	$550,000
Add: Work in process (12/31)	80,000
Total cost of work in process	$630,000

(4) Total manufacturing costs:

Total cost of work in process	$630,000
Less: Work in process (1/1)	210,000
Total manufacturing costs	$420,000

(5) Direct labour:

Total manufacturing costs	$420,000
Less: Total overhead	119,000
Direct materials used	190,000
Direct labour	$ 111,000

EXERCISE 2.32

(a) + $57,400 + $46,500 = $175,650
(a) = $71,750

$175,650 + (b) = $221,500
(b) = $45,850

$221,500 – (c) = $180,725
(c) = $40,775

$68,400 + $86,500 + $81,600 = (d)
(d) = $236,500

$236,500 + $15,600 = (e)
(e) = $252,100

$252,100 – $11,000 = (f)
(f) = $241,100

$273,700 – $130,000 –$102,000 =(g)
(g) = $41,700

$273,700 + (h) = $335,000
(h) = $61,300

$335,000 – $90,000 = (i)
(i) = $245,000

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Additional explanation to EXERCISE 2.32 solution:

Case A

(a)	Total manufacturing costs	$175,650
	Less: Manufacturing overhead	46,500
	Direct labour	57,400
	Direct materials used	$ 71,750

EXERCISE 2.32 (Continued)

(b)	Total cost of work in process	$221,500
	Less: Total manufacturing costs	175,650
	Work in process (1/1/20)	$ 45,850

(c)	Total cost of work in process	$221,500
	Less: Cost of goods manufactured	180,725
	Work in process (12/31/20)	$ 40,775

Case B

(d)	Direct materials used	$ 68,400
	Direct labour	86,500
	Manufacturing overhead	81,600
	Total manufacturing costs	$236,500

(e)	Total manufacturing costs	$236,500
	Work in process (1/1/20)	15,600
	Total cost of work in process	$252,100

(f)	Total cost of work in process	$252,100
	Less: Work in process (12/31/20)	11,000
	Cost of goods manufactured	$241,100

Case C

(g)	Total manufacturing costs	$273,700
	Less: Manufacturing overhead	102,000
	Direct materials used	130,000
	Direct labour	$ 41,700

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EXERCISE 2.32 (Continued)

(h) Total cost of work in process $335,000
Less: Total manufacturing costs.....273,700
Work in process (1/1/20).....$ 61,300

(i) Total cost of work in process..... $335,000
Less: Work in process (12/20)..... 90,000
Cost of goods manufactured $245,000

EXERCISE 2.33

(a) (a) $127,000 + $140,000 + $89,000 = $356,000

(b) $356,000 + $33,000 – $360,000 = $29,000

(c) $430,000 – ($200,000 + $123,000) = $107,000

(d) $40,000 + $470,000 – $430,000 = $80,000

(e) $257,000 – ($80,000 + $100,000) = $77,000

(f) $257,000 + $60,000 – $80,000 = $237,000

(g) $308,000 – ($67,000 + $75,000) = $166,000

(h) $308,000 + $45,000 – $270,000 = $83,000

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EXERCISE 2.33 (Continued)

(b)

IKERD COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2020

Work in process, January 1	$ 33,000
Direct materials	$127,000
Direct labour	140,000
Manufacturing overhead	89,000
Total manufacturing costs	356,000
Total cost of work in process	389,000
Less: Work in process, December 31	29,000
Cost of goods manufactured	$360,000

EXERCISE 2.34

(a)

AIKMAN CORPORATION
Cost of Goods Manufactured Schedule
For the Month Ended June 30, 2020

Work in process, June 1		$ 3,000
Direct materials used		$25,000
Direct labour		30,000
Manufacturing overhead		
Indirect factory labour	$4,500	
Factory manager's salary	3,000	
Indirect materials	2,200	
Depreciation, factory equipment	1,400	
Maintenance, factory equipment	1,800	
Factory utilities	400	
Total manufacturing overhead		13,300
Total manufacturing costs		68,300
Total cost of work in process		71,300
Less: Work in process, June 30		2,800
Cost of goods manufactured		$68,500

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EXERCISE 2.34 Continued)

(b)

AIKMAN CORPORATION
Income Statement (Partial)
For the Month Ended June 30, 2020

Net sales	**$87,100**
Cost of goods sold	
Finished goods inventory, June 1	**$ 5,000**
Cost of goods manufactured [from (a)]	**68,500**
Cost of goods available for sale	**73,500**
Finished goods inventory, June 30	**9,500**
Cost of goods sold	**64,000**
Gross profit	**$23,100**

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EXERCISE 2.35

(a)

DANNER, LETOURNEAU, AND MAJEWSKI
Schedule of Cost of Contract Services Provided
For the Month Ended August 31, 2020

Supplies used (direct materials)		$ 2,500
Salaries of professionals (direct labour)		15,600
Service overhead:		
Utilities for contract operations	$1,900	
Contract equipment depreciation	900	
Insurance on contract operations	800	
Janitorial services for professional offices	300	3,900
Cost of contract services provided		$22,000

(b) The costs not included in the cost of contract services provided would all be classified as period costs. They would be reported on the income statement under administrative expenses.

EXERCISE 2.36

(a) Work-in-process, 1/1			$ 13,500
Direct materials used			
Raw materials inventory, 1/1	$ 21,000		
Materials purchased	150,000		
Materials available for use	171,000		
Less: Materials inventory, 12/31	30,000	$141,000	
Direct labour		220,000	
Manufacturing overhead		180,000	
Total manufacturing costs		541,000	
Total cost of work in process		554,500	
Less: Work in process, 12/31		17,200	
Cost of goods manufactured		$537,300	

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EXERCISE 2.36 (Continued)

SASSAFRAS COMPANY
Income Statement (Partial)
For the Year Ended December 31, 2020

(b)	**Sales revenue**	**$910,000**
	Cost of goods sold	
	Finished goods, 1/1	**$ 27,000**
	Cost of goods manufactured (from (a))	**537,300**
	Cost of goods available for sale	**564,300**
	Less: Finished goods, 12/31	**21,000**
	Cost of goods sold	**543,300**
	Gross profit	**$366,700**

SASSAFRAS COMPANY
(Partial) Balance Sheet
December 31, 2020

(c)	**Current assets**	
	Inventories	
	Finished goods	**$21,000**
	Work in process	**17,200**
	Raw materials	**30,000**
		$68,200

(d) In a merchandising company's income statement, the only difference would be in the computation of cost of goods sold. The beginning and ending finished goods inventory would be replaced by beginning and ending merchandise inventory and the cost of goods manufactured total would be replaced by purchases. In a merchandising company's balance sheet, there would be one inventory account (merchandise inventory) instead of three.

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EXERCISE 2.37

1.	(a)	9.	(a)
2.	(a) [1]	10.	(a), (b)
3.	(a), (c)	11.	(b)
4.	(b) [1]	12.	(b)
5.	(a)	13.	(a)
6.	(a)	14.	(a)
7.	(a)	15.	(a)
8.	(b), (c)	16.	(a)

[1]Only ending inventory is reflected on the balance sheet. Opening inventory would be reflected as the closing inventory of the previous year in a comparative balance sheet.

EXERCISE 2.38

(a)

KANANASKIS MANUFACTURING
Cost of Goods Manufactured Schedule
For the Month Ended June 30, 2020

Work in process inventory, June 1		$ 5,000
Direct materials used		
Raw materials inventory, June 1	$ 10,000	
Raw materials purchases	64,000	
Total raw materials available for use	74,000	
Less: Raw materials inventory, June 30	13,100	$60,900
Manufacturing overhead		
Direct labour		57,000
Indirect labour	7,500	
Factory insurance	4,000	
Machinery depreciation	5,000	
Factory utilities	3,100	
Machinery repairs	1,800	
Miscellaneous factory costs	1,500	22,900
Total manufacturing costs		140,800
Total cost of work in process		145,800
Less: Work in process inventory, June 30		13,000
Cost of goods manufactured		$132,800

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EXERCISE 2.38 (Continued)

(b)

KANANASKIS MANUFACTURING
(Partial) Balance Sheet
As at June 30, 2020

Current assets	
Inventories	
Finished goods	**$ 6,000**
Work in process	**13,000**
Raw materials	**13,100**
	$32,100

EXERCISE 2.39

(a) Raw Materials account:
5,000 units purchased; 4,650 units used = 350 units remaining
350 units x $8 each = $2,800

Work in Process account:
4,600 units were used in manufacturing; 90% in completed autos
(4,600 × 10%) × $8 = $3,680

Finished Goods account:
4,600 x 90% completed; 75% of completed autos sold
(4,600 × 90% × 25%) × $8 = $8,280

Cost of Goods Sold account:
4,600 x 90% completed; 75% of completed autos sold
(4,600 × 90% × 75%) × $8 = $24,840

Selling Expenses account: 50 × $8 = $400

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EXERCISE 2.39 (Continued)

Proof of cost of head lamps allocated (5,000 × $8 = $40,000)

Raw materials	**$ 2,800**
Work in process	**3,680**
Finished goods	**8,280**
Cost of goods sold	**24,840**
Selling expenses	**400**
Total	**$40,000**

(b) To: Chief Accountant

From: Student

Subject: Statement Presentation of Accounts

Two accounts will appear on the income statement. Cost of Goods Sold will be deducted from net sales in determining gross profit. Selling Expenses will be shown under operating expenses and will be deducted from gross profit in determining net income. Sometimes, the calculation for Cost of Goods Sold is shown on the income statement. In these cases, the balance in Finished Goods inventory would also be shown on the income statement.

The other accounts associated with the head lamps are inventory accounts that contain end-of-period balances. Thus, they will be reported under inventories in the current assets section of the balance sheet in the following order: finished goods, work in process, and raw materials.

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SOLUTIONS TO PROBLEMS: SET A

PROBLEM 2.40A

(a)

Cost Item	Product Costs: Direct Materials	Product Costs: Direct Labour	Product Costs: Manufact. Overhead	Period Costs
Maintenance on factory building			$ 1,300	
Factory manager's salary			4,000	
Advertising for helmets				$ 8,000
Sales commissions				5,000
Depreciation on factory building			700	
Rent on factory equipment			6,000	
Insurance on factory building			3,000	
Raw materials	$20,000			
Utility costs for factory			800	
Supplies for general office				200
Wages for assembly-line workers		$55,000		
Depreciation on office equipment				500
Miscellaneous materials			2,000	
	$20,000	$55,000	$17,800	$13,700

(b) Total production costs

Direct materials	$20,000
Direct labour	55,000
Manufacturing overhead	17,800
Total production cost	$92,800

Production cost per motorcycle helmet = $92,800/1,000 = $92.80

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PROBLEM 2.41A

(a)

Cost Item	Direct Materials	Direct Labour	MOH	Period Costs
Raw materials (1)	$60,000			
Wages for workers (2)		$65,000		
Rent on equipment			$ 1,500	
Indirect materials (3)			7,500	
Factory supervisor's salary			3,500	
Factory janitorial costs			1,400	
Advertising				$6,000
Depreciation–factory building (4)			800	
Property taxes–factory building (5)			600	
	$60,000	$65,000	$15,300	$6,000

(1) $24 × 2,500 = $60,000
(2) $13 × 2 hrs. × 2,500 = $65,000
(3) $3 × 2,500 = $7,500
(4) $9,600/12 = $800
(5) $7,200/12 = $600

(b) Total production costs

Direct materials	$ 60,000
Direct labour	65,000
Manufacturing overhead	15,300
Total production cost	$140,300

Production cost per driver = $140,300 ÷ 2,500 = $56.12

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PROBLEM 2.42A

(a) Case 1

Total manufacturing costs = (a)
(a) = $6,300 + $3,000 + $6,000 = $15,300

Ending work in process inventory = (b)
$15,300 + $1,000 – (b) = $14,600
(b) = $15,300 + $1,000 – $14,600 = $1,700

Beginning finished goods inventory = (c)
$14,600 + (c) = $18,300
(c) = $18,300 – $14,600 = $3,700

Cost of goods sold = (d)
(d) = $18,300 – $1,500 = $16,800

Gross profit = (e)
(e) = ($22,500 – $1,500) – $16,800 = $4,200

Net income = (f)
(f) = $4,200 – $2,700 = $1,500

Case 2

Direct materials used = (g)
(g) + $8,000 + $4,000 = $18,000
(g) = $18,000 – $8,000 – $4,000 = $6,000

Beginning work in process inventory = (h)
$18,000 total manufacturing costs + (h) beginning work in process – $3,000 ending work in process = $22,000
(h) = $22,000 + $3,000 – $18,000 = $7,000

Cost of goods sold = (k)
(k) = $3,300 beginning inventory + $22,000 Cost of goods manufactured – $2,500 ending inventory = $22,800

(Note: Item (i) can only be solved after item (k) is solved.)

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PROBLEM 2.42A (Continued)

Sales = (i)
((i) – $1,400) – (k) = $6,000
((i) – $1,400) – $22,800 = $6,000
(i) = $1,400 + $22,800 + $6,000 = $30,200

Goods available for sale = (j)
(j) = $22,000 + $3,300 = $25,300

Operating expenses = (l)
$6,000 – (l) = $2,200
(l) = $3,800

(b)

CASE 1
Cost of Goods Manufactured Schedule

Work in process, beginning	$ 1,000
Direct materials	$6,300
Direct labour	3,000
Manufacturing overhead	6,000
Total manufacturing costs	15,300
Total cost of work in process	16,300
Less: Work in process, ending	1,700
Cost of goods manufactured	$14,600

(c)

CASE 1
Income Statement

Sales	$22,500
Less: Sales discounts	1,500
Net sales	$21,000
Cost of goods sold	
Finished goods inventory, beginning	3,700
Cost of goods manufactured	14,600
Cost of goods available for sale	18,300
Less: Finished goods inventory, ending	1,500
	16,800
Gross profit	4,200
Operating expenses	2,700
Net income	$ 1,500

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PROBLEM 2.42A (Continued)

CASE 1
(Partial) Balance Sheet

Current assets	
Cash	**$ 3,000**
Receivables (net)	**10,000**
Inventories	
Finished goods	**$1,500**
Work in process	**1,700**
Raw materials	**700**
	3,900
Prepaid expenses	**200**
Total current assets	**$17,100**

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PROBLEM 2.43A

(a)

STELLAR MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2020

Work in process, (1/1)		$ 9,500
Direct materials		
Raw materials inventory, (1/1)	$ 47,000	
Raw materials purchases	62,500	
Total raw materials available for use	109,500	
Less: Raw materials inventory, (12/31)	44,800	
Direct materials used		$ 64,700
Direct labour		145,100
Manufacturing overhead		
Indirect labour	18,100	
Factory insurance	7,400	
Factory machinery depreciation	7,700	
Factory utilities	12,900	
Plant manager's salary	40,000	
Factory property taxes	6,900	
Factory repairs	800	
Total manufacturing overhead		93,800
Total manufacturing costs		303,600
Total cost of work in process		313,100
Less: Work in process, (12/31)		7,500
Cost of goods manufactured		$305,600

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PROBLEM 2.43A (Continued)

(b)

STELLAR MANUFACTURING COMPANY
(Partial) Income Statement
For the Year Ended December 31, 2020

Sales revenues	
Sales	**$465,000**
Less: Sales discounts	**2,500**
Net sales	**$462,500**
Cost of goods sold	
Finished goods inventory, (1/1)	**85,000**
Cost of goods manufactured	**305,600**
Cost of goods available for sale	**390,600**
Less: Finished goods inventory, (12/31)	**77,800**
Cost of goods sold	**312,800**
Gross profit	**$149,700**

(c)

STELLAR MANUFACTURING COMPANY
(Partial) Balance Sheet
As at December 31, 2020

Assets	
Current assets	
Cash	**$ 28,000**
Accounts receivable	**27,000**
Inventories:	
Finished goods	**$77,800**
Work in process	**7,500**
Raw materials	**44,800**
	130,100
Total current assets	**$185,100**

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PROBLEM 2.44A

(a)

TOMBERT COMPANY
Cost of Goods Manufactured Schedule
For the Month Ended October 31, 2020

Work in process, October 1		$ 16,000
Direct materials		
Raw materials inventory, October 1	$ 18,000	
Raw materials purchases	264,000	
Total raw materials available for use	282,000	
Less: Raw materials inventory, October 31	29,000	
Direct materials used		$253,000
Direct labour		190,000
Manufacturing overhead		
Rent on factory facilities	60,000	
Depreciation on factory equipment	31,000	
Indirect labour	28,000	
Factory utilities*	9,000	
Factory insurance**	4,800	
Total manufacturing overhead		132,800
Total manufacturing costs		575,800
Total cost of work in process		591,800
Less: Work in process, October 31		14,000
Cost of goods manufactured		$577,800

*$12,000 × 75% = $9,000
**$8,000 × 60% = $4,800

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PROBLEM 2.44A (Continued)

(b)

TOMBERT COMPANY
Income Statement
For the Month Ended October 31, 2020

Sales (net)	$780,000
Cost of goods sold	
Finished goods inventory, October 1	$ 30,000
Cost of goods manufactured	577,800
Cost of goods available for sale	607,800
Less: Finished goods inventory, October 31	45,000
Cost of goods sold	562,800
Gross profit	217,200
Operating expenses	
Advertising expense	90,000
Selling and administrative salaries	75,000
Depreciation expense on sales equipment	45,000
Utilities expense*	3,000
Insurance expense**	3,200
Total operating expenses	216,200
Net income	$ 1,000

*$12,000 × 25%

**$8,000 × 40%

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PROBLEM 2.45A

(a)	Raw materials inventory, beginning.....	$ 9,600
	Raw materials purchased[(1)].....	28,800
	Raw materials available for use.....	38,400
	Less: Raw materials inventory, ending.....	10,400
	Raw materials used in production	$28,000

[1] $28,000 + $10,400 = $38,400
$38,400 – $9,600 = $28,800

(b)	Work in process inventory, beginning	$ 14,600
	Manufacturing costs added	160,000
	Total work in process during the month.....	174,600
	Less: Work in process inventory, ending	13,000
	Cost of goods manufactured [(2)]	$161,600

[2]$14,600 + $160,000 – $13,000 = $161,600

(c)	Finished goods inventory, beginning	$ 9,600
	Cost of goods manufactured	161,600
	Cost of goods available for sale.....	171,200
	Less: Finished goods inventory, ending	9,200
	Cost of goods sold[3]	$162,000

[3]$9,600 + $161,600 – $9,200 = $162,000

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PROBLEM 2.46A

(a) Cost of goods sold = manufacturing cost per unit × number of units sold
Cost of goods sold = ($3,000,000 ÷ 300,000) × 298,500
= $2,985,000

(b) Gross Profit = Sales – Cost of goods sold
= ($18 × 298,500) – $2,985,000
= $2,388,000

(c) Cost of finished goods = number of units in inventory × per unit product cost
Cost of finished goods = (300,000 – 298,500) × $10[1]
= $15,000

[1]$3,000,000 ÷ 300,000 = $10 per unit

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PROBLEM 2.47A

(1)(a)	Raw materials inventory, beginning	$18,000
	Plus: Raw materials purchased	100,000
	Raw materials available for use	118,000
	Less: Raw materials inventory, ending	18,000
	Raw materials used in production	100,000
	Less: Indirect materials	10,000
	Direct materials used	$ 90,000
(b)	Manufacturing costs for the month	$285,000
	Less: Direct materials used	90,000
	Less: Manufacturing overhead	115,000
	Direct labour	$80,000
(c)	Work in process, beginning	$ 8,000
	Plus: Manufacturing costs for the month	285,000
	Total cost of work in process	297,000
	Less: Work in process, ending	20,000
	Cost of goods manufactured*	$277,000

*This is the value of product transferred to finished goods.

(d) Cost of goods sold + 40% markup = Sales
Sales = 140% × COGS
COGS = $420,000 ÷ 1.40 = $300,000

(e)	Cost of goods sold (from (d))	$300,000
	Plus: Finished goods inventory, ending	20,000
	Goods available for sale	320,000
	Less: Cost of goods manufactured	277,000
	Finished goods inventory, beginning	$ 43,000

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PROBLEM 2.47A (Continued)

(2) Variable costs vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis. Fixed costs remain constant in total regardless of changes in the activity level but vary on a per-unit basis.

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PROBLEM 2.48A

(a)	**Raw materials used in production**	**$180,000**
	Plus: Raw materials inventory, ending	**55,000**
	Raw materials available for use	**235,000**
	Less: Raw materials inventory, beginning	**25,000**
	Raw materials purchased	**$210,000**
(b)	**Cost incurred for the month (10,000 hrs × $15)**	**$150,000**
	Plus: Beginning of the month accrual	**10,000**
		160,000
	Less: End of the month accrual	**20,000**
	Cash disbursements for labour	**$140,000**
(c)	**Work in process inventory, beginning**	**$ 15,000**
	Plus: Materials used in production	**180,000**
	Labour costs (10,000 hrs × $15)	**150,000**
	Manufacturing overhead	**100,000**
		445,000
	Less: Work in process inventory, ending	**4,500**
	Cost of goods transferred to finished goods	**$440,500**
(d)	**Cost of goods sold**	**$400,000**
	Plus: Finished goods inventory, ending	**50,000**
	Goods available for sale	**450,000**
	Less: Transferred from work in process (c)	**440,500**
	Finished goods inventory, beginning	**$ 9,500**

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SOLUTIONS TO PROBLEMS: SET B

PROBLEM 2.49B

(a)

Cost Item	Product Costs: Direct Materials	Product Costs: Direct Labour	Product Costs: Manufact. Overhead	Period Costs
Maintenance on factory building			$ 1,500	
Factory manager's salary			4,000	
Advertising for helmets				8,000
Sales commissions				5,000
Depreciation on factory building			700	
Rent on factory equipment			6,000	
Insurance on factory building			3,000	
Raw materials	$20,000			
Utility costs for factory			800	
Supplies for general office				200
Wages for assembly-line workers		$54,000		
Depreciation on office equipment				500
Miscellaneous materials			2,000	
	$20,000	$54,000	$18,000	$13,700

(b) Total production costs

Direct materials	$20,000
Direct labour	54,000
Manufacturing overhead	18,000
Total production cost	$92,000

Production cost per motorcycle helmet = $92,000 ÷ 1,000 = $92

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PROBLEM 2.50B

(a)

Cost Item	Product Costs: Direct Materials	Product Costs: Direct Labour	Product Costs: MOH	Period Costs
Raw materials (1)	$57,500			
Wages for workers (2)		$65,000		
Rent on equipment			$ 1,300	
Indirect materials (3)			7,500	
Factory supervisor's salary			3,500	
Factory janitorial costs			1,400	
Advertising				$6,000
Depreciation – factory (4)			700	
Property taxes – factory (5)			600	
	$57,500	$65,000	$15,000	$6,000

(1) $23 × 2,500 = $57,500
(2) $13 × 2 hours × 2,500 = $65,000
(3) $3 × 2,500 = $7,500
(4) $8,400 ÷ 12 = $700
(5) $7,200 ÷ 12 = $600

(b) Total production costs

Direct materials	$ 57,500
Direct labour	65,000
Manufacturing overhead	15,000
Total production cost	$137,500

Production cost per racquet = $137,500 ÷ 2,500 = $55

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PROBLEM 2.51B

(a) Case 1

Total manufacturing costs = (a)
(a) = $6,300 + $3,000 + $6,000 = $15,300

Ending work in process inventory = (b)
$15,300 + $1,000 – (b) = $15,800
(b) = $15,300 + $1,000 – $15,800 = $500

Beginning finished goods inventory = (c)
(c) + $15,800 = $18,300
(c) = $18,300 – $15,800 = $2,500

Cost of goods sold = (d)
(d) = $18,300 – $1,200 = $17,100

Gross profit = (e)
(e) = ($22,500 – $1,500) – $17,100 = $3,900

Net Income = (f)
(f) = $3,900 – $2,700 = $1,200

Case 2

Direct materials used = (g)
(g) + $4,000 + $5,000 = $16,000
(g) = $16,000 – $4,000 – $5,000 = $7,000

Beginning work in process inventory = (h)
$16,000 + (h) – $2,000 = $20,000
(h) = $20,000 + $2,000 – $16,000 = $6,000

Goods available for sale = (j)
(j) = $20,000 + $5,000 = $25,000

Cost of goods sold = (k)
(k) = $25,000 – $2,500 = $22,500

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PROBLEM 2.51B (Continued)

(Note: Item (i) can only be solved after items (j) and (k) are solved.)
Sales = (i)
((i) – $1,200) – (k) = $6,000
((i) – $1,200) – $22,500 = $6,000
(i) = $1,200 + $22,500 + $6,000 = $29,700

Operating expenses = (l)
$6,000 – (l) = $2,200
(l) = $3,800

(b)

CASE 1
Cost of Goods Manufactured Schedule

Work in process, beginning	$ 1,000
Direct materials	$6,300
Direct labour	3,000
Manufacturing overhead	6,000
Total manufacturing costs	15,300
Total cost of work in process	16,300
Less: Work in process, ending	500
Cost of goods manufactured	$15,800

(c)

CASE 1
Income Statement

Sales	$22,500
Less: Sales discounts	1,500
Net sales	$21,000
Cost of goods sold	
Finished goods inventory, beginning	$ 2,500
Cost of goods manufactured	15,800
Cost of goods available for sale	18,300
Finished goods inventory, ending	1,200
Cost of goods sold	17,100
Gross profit	3,900
Operating expenses	2,700
Net income	$ 1,200

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PROBLEM 2.51B (Continued)

CASE 1
(Partial) Balance Sheet

Current assets	
Cash	**$ 3,000**
Receivables (net)	**10,000**
Inventories	
Finished goods	**$1,200**
Work in process	**500**
Raw materials	**700**
	2,400
Prepaid expenses	**200**
Total current assets	**$15,600**

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PROBLEM 2.52B

(a)

RUIZ MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2020

Work in process inventory (1/1).		$ 9,500
Direct materials		
Raw materials inventory (1/1) ..	$ 47,000	
Raw materials purchases.....	62,500	
Raw materials available for use	109,500	
Less: Raw materials inventory (12/31).....	44,200	
Direct materials used.....		$ 65,300
Direct labour		145,100
Manufacturing overhead		
Plant manager's salary	40,000	
Indirect labour	18,100	
Factory utilities.....	12,900	
Factory machinery depreciation.....	7,700	
Factory insurance	7,400	
Factory property taxes.....	6,100	
Factory repairs	800	
Total manufacturing overhead...		93,000
Total manufacturing costs .		303,400
Total cost of work in process		312,900
Less: Work in process, (12/31) .		8,000
Cost of goods manufactured		$304,900

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PROBLEM 2.52B (Continued)

(b)

RUIZ MANUFACTURING COMPANY
(Partial) Income Statement
For the Year Ended December 31, 2020

Sales revenues		
Sales	$465,000	
Less: Sales discounts	2,500	
Net sales	$462,500	
Cost of goods sold		
Finished goods inventory, (1/1)	85,000	
Cost of goods manufactured (see schedule)	304,900	
Cost of goods available for sale	389,900	
Finished goods inventory, (12/31)	67,800	
Cost of goods sold		322,100
Gross profit		$140,400

(c)

RUIZ MANUFACTURING COMPANY
(Partial) Balance Sheet
As at December 31, 2020

Assets		
Current assets		
Cash	$ 28,000	
Accounts receivable	27,000	
Inventories		
Finished goods	$67,800	
Work in process	8,000	
Raw materials	44,200	
	120,000	
Total current assets		$175,000

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PROBLEM 2.53B

(a) Prime costs = direct materials + direct labour
Prime costs = $200,000 + $160,000 = $360,000

(b) Conversion costs = direct labour + manufacturing overhead
Conversion costs = $160,000 + $128,000* = $288,000

***Manufacturing overhead = ($160,000/$10) × $8**

(c)

Cost of goods manufactured =	
Beginning work in process inventory	**$ 80,000**
+ total manufacturing costs[1]	**488,000**
	568,000
– Ending work in process inventory	**50,000**
	$518,000

[1]$200,000 + $160,000 + $128,000

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PROBLEM 2.54B

(a) Let GP = Gross profit
GP – non-manufacturing costs = net income
GP = $50,000 + $170,000 = $220,000

(b) Let COGS = Cost of goods sold
Sales – COGS = gross profit
COGS = $560,000 – $220,000 = $340,000

(c) Let EFI = Ending finished goods inventory
EFI = Beginning finished goods inventory +
cost of goods manufactured – COGS
EFI = $270,000 + $260,000 – $340,000 = $190,000

(d) Let TMC = total manufacturing costs
Let BWI = Beginning work in process inventory
Let EWI = Ending work in process inventory
Let COGM = Cost of goods manufactured
BWI + TMC – EWI = COGM
$110,000 + TMC – $0 = $260,000
TMC = $150,000

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PROBLEM 2.55B

(1)(a)	Raw materials inventory, beginning	$28,000
	Plus: Raw material purchased	150,000
	Raw materials available for use	178,000
	Less: Direct materials used	125,000
		53,000
	Less: Indirect materials transferred out	20,000
	Raw materials inventory, ending	$ 33,000
(b)	Manufacturing costs for the month	$498,000
	Less: Direct materials used	125,000
	Less: Manufacturing overhead	145,000
	Direct labour	$228,000
(c)	Work in process, beginning	$ 38,000
	Plus: Manufacturing costs for the month	498,000
	Total cost of work in process	536,000
	Less: Work in process, ending	30,000
	Cost of goods manufactured*	$506,000

*This is the value of product transferred to finished goods.

(d) Cost of goods sold + 30% markup = Sales
Sales = 130% × COGS
COGS = $780,000 ÷ 1.30 = $600,000

(e)	Cost of goods sold (from (d))	$600,000
	Plus: Finished goods inventory, ending	25,000
	Goods available for sale	625,000
	Less: Cost of goods manufactured	506,000
	Finished goods inventory, beginning	$119,000

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PROBLEM 2.55B (Continued)

(2) Variable costs vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis. Fixed costs remain constant in total regardless of changes in the activity level but vary on a per-unit basis.

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PROBLEM 2.56B

(a)

AGLER COMPANY
Cost of Goods Manufactured Schedule
For the Month Ended August 31, 2020

Work in process, August 1		$ 25,000
Direct materials		
Raw materials inventory, August 1	$ 19,500	
Raw materials purchases	200,000	
Total raw materials available for use	219,500	
Less: Raw materials inventory, August 31	30,000	
Direct materials used		$189,500
Direct labour		160,000
Manufacturing overhead		
Rent on factory facilities	$ 60,000	
Depreciation on factory equipment	35,000	
Indirect labour	20,000	
Factory utilities*	5,000	
Factory insurance**	3,500	
Total manufacturing overhead		123,500
Total manufacturing costs		473,000
Total cost of work in process		498,000
Less: Work in process, August 31		21,000
Cost of goods manufactured		$477,000

*$10,000 × 50%
**$5,000 × 70%

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PROBLEM 2.56B (Continued)

(b)

AGLER COMPANY
Income Statement
For the Month Ended August 31, 2020

Sales (net)	$675,000
Cost of goods sold	
Finished goods inventory, August 1	$ 40,000
Cost of goods manufactured	477,000
Cost of goods available for sale	517,000
Less: Finished goods inventory, August 31	59,000
Cost of goods sold	458,000
Gross profit	217,000
Operating expenses	
Advertising expense	75,000
Selling and administrative salaries	70,000
Depreciation on sales equipment	50,000
Utilities expense*	5,000
Insurance expense**	1,500
Total operating expenses	201,500
Net income	$ 15,500

*$10,000 × 50%
**$5,000 × 30%

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PROBLEM 2.57B

(a) Cost of goods sold = $390 – $70 = $320 million

(b) Total factory overhead cost =
$320 – $80 – $180 = $60 million

(c) Selling and administrative expenses =
$70 – $22 = $48 million

(d) Total product costs = DM + DL + MOH =
$80 + $180 + $60 = $320 million

(e) Total period costs = $48 million

(f) Prime cost = DM + DL = $80 + $180 = $260 million

(g) Conversion cost = DL + MOH = $180 + $60 = $240 million

(h) Cost of goods manufactured = $0 + $320 – $0 = $320 million

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PROBLEM 2.58B

Abbreviations used:
Let CON = Conversion cost
Let FOH = Factory overhead costs
Let PRI = Prime cost
Let TMC = Total manufacturing costs
BDMI is Beginning Direct Materials Inventory
EDMI is Ending Direct Materials Inventory

(a) Calculations:

Gross profit = $900,000 × 20% = $180,000
Cost of goods sold = $900,000 – $180,000 = $720,000

CON = $360,000 + (40% × CON)
(0.6 × CON) = $360,000
CON = $600,000
FOH = $600,000 – $360,000 = $240,000

PRI = 70% × TMC
DM + DL = 0.70(DM + DL + FOH)
1.0DM – 0.70DM = 0.70(DL + FOH) – DL
0.30DM = 0.70($360,000 + $240,000) – $360,000
DM = $200,000

TMC = $200,000 + $360,000 + $240,000 = $800,000

Ending WIP = 10% × TMC = 0.10 × $800,000 = $80,000

COGM = BWIP + TCM – EWIP = $68,000 + $800,000 – $80,000 = $788,000

BFI + COGM – EFI = COGS
EFI = $30,000 + $788,000 – $720,000 = $98,000 (1)

EDMI = BDMI + DM Purchases – DM Used
EDMI = $32,000 + $320,000 – $200,000 = $152,000

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PROBLEM 2.58B (Continued)

MEDIUM-SIZED COMPANY
Cost of Goods Manufactured Schedule
For the Month Ended January 31, 2020

Work in process, beginning		$ 68,000
Direct materials		
Direct materials inventory, January 1	$ 32,000	
Direct materials purchases	320,000	
Total direct materials available for use	352,000	
Less: Direct materials inventory, January 31[(2)]	152,000	
Direct materials used		$200,000
Direct labour		360,000
Manufacturing overhead		240,000
Total manufacturing costs		800,000
Total cost of work in process		868,000
Less: Work in process, ending [(3)]		80,000
Cost of goods manufactured		$788,000

(b) Inventories destroyed:

Finished goods	$ 98,000[1]
Work in process	80,000[3]
Direct materials	152,000[2]
Total	$330,000

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SOLUTIONS TO CASES

CASE 2.59

Calculations to complete the data for operations in 2020:

Raw materials[1] inventory, beginning	$13,000
Raw materials purchased	13,000
Raw materials available for use	26,000
Direct materials used	20,000
Raw materials inventory, ending	$ 6,000

[1]Assumes all raw materials are used as direct materials

Direct materials	$20,000
Direct labour	25,000
Factory overhead	8,000
Manufacturing costs added during the year	$53,000
Work in process inventory, beginning	$ 8,000
Manufacturing costs (see above)	53,000
Total work in process during the year	61,000
Less: Work in process inventory, ending	7,000
Cost of goods manufactured	$54,000
Finished goods inventory, beginning	$ 6,000
Plus: Cost of goods manufactured (see above)	54,000
Cost of goods available for sale	60,000
Less: Cost of goods sold	55,000
Finished goods inventory, ending	$ 5,000
Sales ($9,000 + $55,000)	$64,000
Less: Cost of goods sold (given)	55,000
Gross profit (given)	9,000

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CASE 2.59 (Continued)

Less: Operating expenses ($9,000 – ($4,000))	**13,000**
Operating income (loss)	**$ (4,000)**

BYDO INC
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2020

Work in process, beginning			**$8,000**
Direct materials:			
Raw materials inventory, beginning	**$13,000**		
Plus: Raw materials purchases	**13,000**		
Total raw materials available for use	**26,000**		
Less: Raw materials inventory, ending	**6,000**		
Direct materials used		**$20,000**	
Direct labour		**25,000**	
Factory overhead		**8,000**	
Total manufacturing costs			**53,000**
Total cost of work in process			**61,000**
Less: Work in process, ending			**7,000**
Cost of goods manufactured			**$54,000**

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BYDO INC
Schedule of Cost of Goods Sold
For the Year Ended December 31, 2020

Finished goods inventory, beginning	$ 6,000
Plus: Cost of goods manufactured	54,000
Cost of goods available for sale	60,000
Less: Finished goods inventory, ending	5,000
Cost of goods sold	$55,000

BYDO INC
Income Statement
For the Year Ended December 31, 2020

Sales	$64,000
Less: Cost of goods sold	55,000
Gross profit	90,000
Less: Operating expenses	13,000
Operating income (loss)	$(4,000)

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CASE 2.60

(a) Direct materials inventory, beginning	**$ 6,000**
Plus: Direct materials purchased	**18,000**
Direct materials available for use	**24,000**
Less: Direct materials inventory, ending	**10,000**
Direct materials used in production	**$14,000**

(b) Finished goods inventory, beginning	**$12,000**
Plus: Cost of goods manufactured	**26,500[3]**
Cost of goods available for sale	**38,500[2]**
Less: Finished goods inventory, ending	**2,500**
Cost of goods sold	**$ 36,000[1]**

[1]COGS = Sales of $60,000 × (100% – 40% Gross profit) = $36,000
[2] $36,000 + $2,500 = $38,500
[3] $38,500 – $12,000 = $26,500 which is cost of goods transferred out

Note: What we are looking for here is the "cost of goods manufactured" (which is footnote 3). In order to calculate this, we need to calculate "cost of goods available for sale" (which is footnote 2). In order to calculate this, we need to know "cost of goods sold," which we can calculate from the information provided (footnote 1).

(c) Finished goods inventory, beginning	**$12,000**
Cost of goods manufactured	**28,000[4]**
Cost of goods available for sale	**$40,000**
Work in process inventory, beginning	**$ 2,000**
Plus: Direct materials used	**20,000**
Plus: Conversion costs	**22,000**
Total cost of work in process	**44,000**
Less: Work in process inventory, ending	**16,000[6]**
Cost of goods manufactured	**$28,000[5]**

[4] $40,000 – $12,000 = $28,000
[5] Cost of goods manufactured = $28,000 from point (4)
[6] ($2,000 + $20,000 + $22,000) – $28,000 = $16,000

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CASE 2.61

(a)

Sayers Manufacturing
Cost of Goods Manufactured Schedule
For the Month Ended January 31, 2020

Work in process, beginning		$ 110,000
Direct materials:		
Direct materials inventory, beginning	$80,000	
Plus: Direct materials purchases	900,000	
Total direct materials available for use	980,000	
Less: Direct materials inventory, ending	90,000	
Direct materials used	890,000	
Direct labour	710,000	
Manufacturing overhead[1]	386,600	
Total manufacturing costs		1,986,600
Total cost of work in process		2,096,600
Less: Work in process, ending		74,600
Cost of goods manufactured		$2,022,000

[1] $75,000 + $50,000 + $125,000 + $92,500 + $2,800 + $10,000 + $31,300

(b)

Sayers Manufacturing
Schedule of Cost of Goods Sold
For the Month Ended January 31, 2020

Finished goods inventory, beginning	$ 95,000
Plus: Cost of goods manufactured	2,022,000
Cost of goods available for sale	2,117,000
Less: Finished goods inventory, ending	108,000
Cost of goods sold	$2,009,000

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CASE 2.62

(a)	Direct costs of production	$220
	Indirect costs of production	180
	Total costs of production	$400
(b)	Direct materials, beginning	$ 50
	Plus: Direct materials purchased	140
	Total material available for use	190
	Less: Direct materials, ending	80
	Direct materials used	$110
(c)	Direct costs of production	$220
	Less: Direct materials used	110
	Direct labour	$110
(d)	Total variable costs of production[1]	$280
	Less: direct costs of production	220
	Variable overhead costs	$ 60
	[1]Includes DM, DL, VOH	
(e)	Total indirect costs of production[2]	$180
	Less: variable overhead costs	60
	Fixed manufacturing overhead	$120
	[2]Indirect costs are overhead costs – both variable and fixed	

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CASE 2.62 (Continued)

(f)	**Work in process, beginning**		**$140**
	Plus: Manufacturing costs		
	Direct materials	**$110**	
	Direct labour	**110**	
	Variable manufacturing overhead	**60**	
	Fixed manufacturing overhead	**120**	**400**
	Total cost of work in process		**540**
	Less: Work in process, ending		**180**
	Cost of goods manufactured		**$360**

(g)	**Finished goods inventory, beginning**	**$240**
	Plus: Cost of goods manufactured	**360**
	Cost of goods available for sale	**600**
	Less: Finished goods inventory, ending	**250**
	Cost of goods sold	**$350**

(h)	**Direct labour**	**$110**
	Variable manufacturing overhead	**60**
	Fixed manufacturing overhead	**120**
	Total conversion costs	**$290**

(i)	**Direct materials**	**$110**
	Direct labour	**110**
	Total prime costs	**$220**

(j)	**Period costs =**	
	Selling and administrative costs	**$210**

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CASE 2.63

Raw materials inventory, beginning	**$ 19,000**
Plus: Raw materials purchased	**345,000**
Raw materials available for use	**364,000**
Less: Raw materials used in production	**350,000**
Raw materials inventory, ending	**$ 14,000**
Direct materials	**$350,000**
Direct labour	**240,000**
Factory overhead ($240,000 × 60%)	**144,000**
Manufacturing costs added during the year	**$734,000**
Cost of goods available for sale	**$770,000**
Less: finished goods inventory, beginning	**38,000**
Cost of goods manufactured	**$732,000**
Work in process inventory, beginning	**$ 25,000**
Manufacturing costs	**734,000**
Total work in process during the year	**759,000**
Less: Cost of goods manufactured	**732,000**
Work in process inventory, ending	**$ 27,000**
Sales	**$1,260,000**
Less: Gross profit ($1,260,000 × 40%)	**504,000**
Cost of goods sold	**$ 756,000**
Cost of goods available for sale	**$770,000**
Less: cost of goods sold	**756,000**
Finished goods inventory, ending	**$ 14,000**

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CASE 2.64

(a) The stakeholders in this situation are:

- **The users of Robbin Industries' financial statements**
- **Wayne Terrago, controller**
- **The vice-president of finance**
- **The president of Robbin Industries**

(b) The ethical issues in this situation pertain to the adherence to sound and acceptable accounting principles. Intentional violation of current standards in order to satisfy a practical short-term personal or company need, thereby creating misleading financial statements, would be unethical. However, selecting one acceptable method of accounting and reporting among various acceptable methods is not necessarily unethical.

(c) Ethically, the management of Robbin Industries should be trying to report the financial condition and results of operations as fairly as possible; that is, in accordance with current accounting standards. Wayne should inform management what is acceptable accounting and what is not. The basic concept to be supported in this advertising cost transaction is matching costs and revenues. Normally, advertising costs are expensed in the period in which they are incurred because it is very difficult to associate them with specific revenues. Further, as advertising costs are not incurred to manufacture the product they should not be classified as product costs.

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CASE 2.65: "All About You" Activity

There is no one specific correct response. Students should consider the wider implications of the situation, making assumptions as needed.

(a) By eliminating one of the production shifts, the cost of labour could be reduced. However, the shortfall of 1,000 units (11,000 – 10,000) would have to be produced using overtime labour (assuming this is practical). This could result in a higher labour cost per unit than at the 20,000-production level.

Also, it is possible that material costs will increase if the company is no longer able to get volume discounts from its suppliers.

(b) Fixed costs could be reduced by:

- **A partial closure of the plant or consolidating activities to one location in the plant**
- **Subletting a portion of the plant**
- **Closing the plant completely and outsourcing production of the 11,000 units**

(c) Other options for the company to increase profits are to

- **consider utilizing the excess production capacity created by the bankruptcy to produce another product**
- **diversify their customer base**
- **reduce discretionary expenditures**
- **negotiate improved prices from suppliers**
- **research assistance packages from provincial or federal governments**

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SOLUTION TO DECISION-MAKING AT CURRENT DESIGNS

DM2.1

Payee	Purpose	Product Costs			Period Costs
		Direct Materials	Direct Labour	Manufacturing Overhead	
Winona Agency	Property insurance for the manufacturing plant			X	
Bill Johnson (sales manager)	Payroll cheque–payment to sales manager				X
Xcel Energy	Electricity for manufacturing plant			X	
Winona Printing	Price lists for salespeople				X
Jim Kaiser (sales representative)	Sales commissions				X
Dave Thill (plant manager)	Payroll cheque–payment to plant manager			X	
Dana Schultz (kayak assembler)	Payroll cheque–payment to kayak assembler		X		
Composite One	Bagging film used when kayaks are assembled; it is discarded after use			X	
Fastenal	Shop supplies–brooms, paper towels, etc.			X	
Ravago	Polyethylene powder, which is the main ingredient for the rotational moulded kayaks	X			
Winona County	Property taxes on manufacturing plant			X	
North American Composites	Kevlar® fabric for composite kayaks	X			
Waste Management	Garbage disposal for the company office building				X
None	Journal entry to record depreciation of manufacturing equipment			X	

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SOLUTION TO WATERWAYS CONTINUING PROBLEM WCP.2

(a) Direct labour:

($176,000 – $148,000) ÷ ($32,000 – $24,000) = 3.5

	Activity Level	
	High	Low
Total cost	$176,000	$148,000
Less: Variable costs		
32,000 × 3.5	112,000	
24,000 × 3.5		84,000
Total fixed costs	$ 64,000	$ 64,000

The cost formula is: $64,000 + 3.5X.

Hours of operation:

($170,000 – $145,000) ÷ (700 – 500) = $125 per hour

	Activity Level	
	High	Low
Total cost	$170,000	$145,000
Less: Variable costs		
700 × $125	87,500	
500 × $125		62,500
Total fixed costs	$ 82,500	$ 82,500

The cost formula is: $82,500 + $125X.

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WCP.2 (Continued)

(b) First determine the direct labour cost for the month:

$70,000 x (100% - 60%) = $28,000

Then, if we substitute the actual values of the activity bases from the current month we would get the following estimates:

Labour dollars: $64,000 + (3.5 × $28,000) = $162,000

Hours of operation: $82,500 + ($125 × 600) = $157,500

Actual manufacturing overhead for the month is calculated as follows:

Total manufacturing costs (given)		**$315,000**
Less: Direct materials [(1)]	**$132,000**	
Direct labour [(2)]	**28,000**	**160,000**
Manufacturing overhead		**$155,000**

[(1)] Direct materials	
Raw materials inventory, beg.	**$35,000**
Plus: raw material purchases	**191,000**
Raw materials available for use	**226,000**
Less: Raw materials inventory, end	**50,000**
Raw materials used in production	**176,000**
Less: indirect materials (25%)	**44,000**
Direct materials used in production	**$132,000**

[(2)] Total salaries and wages	**$70,000**
Less: Indirect wages (60%)	**42,000**
Direct labour used in production	**$28,000**

As the actual manufacturing overhead was $155,000 for the month, hours of operation would be the better choice as an activity base for predicting manufacturing overhead.

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WCP.2 (Continued)

(c)

Waterways Corporation
Schedule of Cost of Goods Manufactured

Work in process, beginning			$52,000
Direct materials:			
Raw materials inventory, beginning	$35,000		
Raw material purchases	191,000		
Total raw materials available for use	226,000		
Less: Raw materials inventory, ending	50,000		
Raw materials used in production	176,000		
Less: indirect materials	44,000		
Direct materials		$132,000	
Direct labour		28,000	
Manufacturing overhead		155,000	
Total manufacturing costs			315,000
Total cost of work in process			367,000
Less: Work in process, ending (3)			42,000
Cost of goods manufactured			$325,000

(3) **Work in process, ending**

Work in process beginning	$ 52,000
Plus: total manufacturing costs	315,000
Total cost of work in process	367,000
Less: cost of goods manufactured	325,000
Work in process ending	$ 42,000

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