

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

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

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

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	

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. | (d) Product. |
| (b) Period. | (e) Period. |
| (c) Period. | (f) Product. |

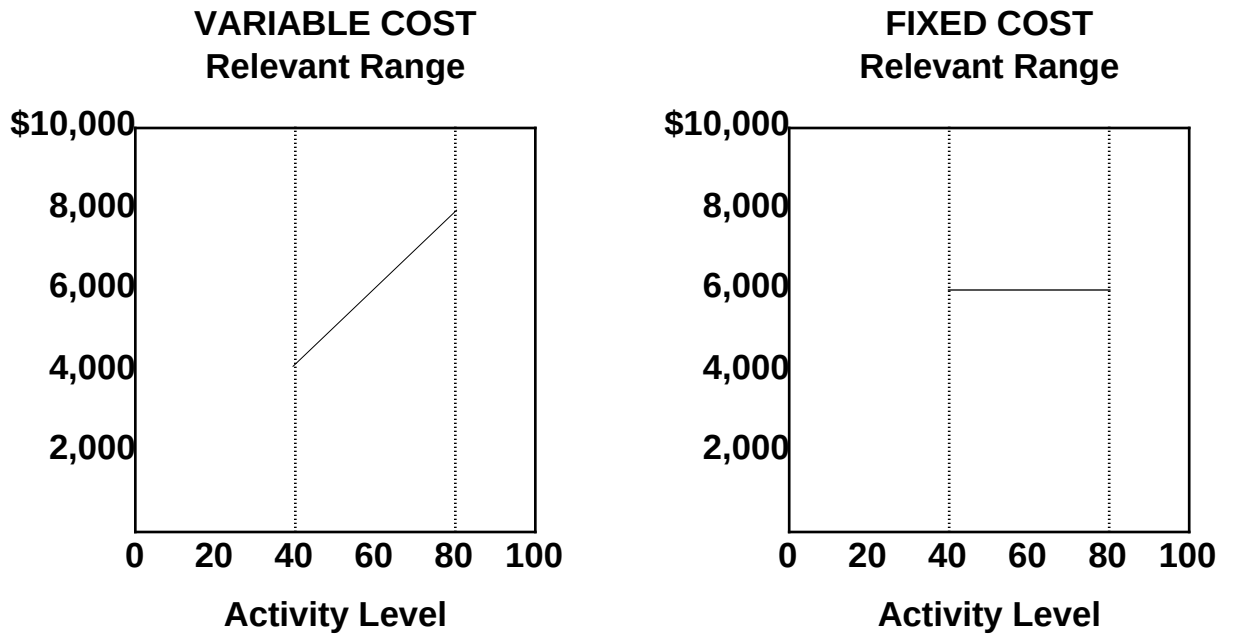
BRIEF EXERCISE 2-4

Indirect labour is a variable cost because it increases in total directly and proportionately with the change in the activity level: $\$10,000 \div 2,000 \text{ units} = \5.00 and $\$20,000 \div 4,000 \text{ units} = \5.00 .

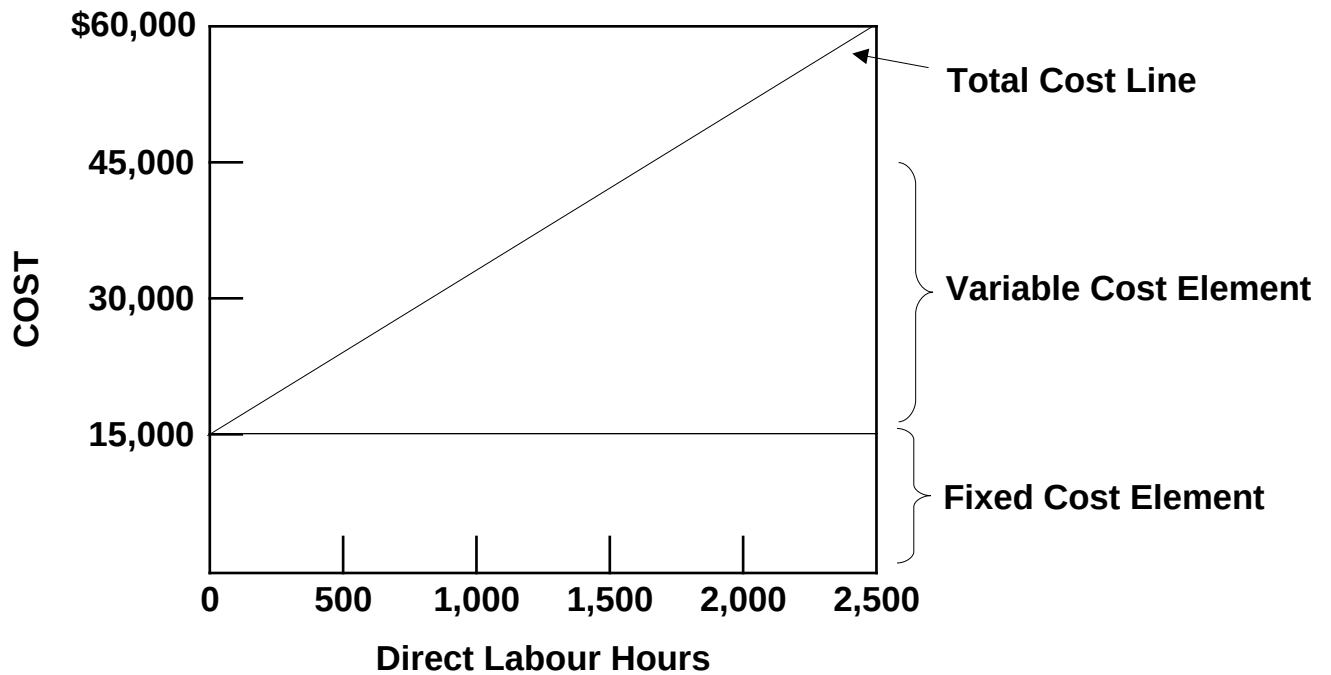
Supervisory salaries are a fixed cost because they remain the same in total regardless of changes in the activity level: \$5,000 at both levels.

Maintenance is a mixed cost because it increases in total but not proportionately with changes in the activity level: $\$4,000 \div 2,000 \text{ units} = \2.00 and $\$7,000 \div 4,000 \text{ units} = \1.75 .

BRIEF EXERCISE 2-5



BRIEF EXERCISE 2-6



BRIEF EXERCISE 2-7

<u>High</u>		<u>Low</u>		<u>Difference</u>
\$16,490	–	\$12,330	=	\$4,160
8,200	–	5,000	=	3,200

$\$4,160 \div 3,200 = \1.30 —Variable cost per kilometer.

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

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

BRIEF EXERCISE 2-8

<u>High</u>		<u>Low</u>		<u>Difference</u>
\$65,000	–	\$32,000	=	\$33,000
40,000	–	18,000	=	22,000

$\$33,000 \div 22,000 = \1.50 per unit.

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

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

BRIEF EXERCISE 2-9

	Product Costs		
	<u>Direct Materials</u>	<u>Direct Labour</u>	<u>Factory Overhead</u>
(a)			X
(b)	X		
(c)			X
(d)		X	

BRIEF EXERCISE 2-10

DIEKER COMPANY
Balance Sheet
December 31, 2016

Current assets

Cash.....		\$ 62,000
Accounts receivable.....		200,000
Inventories		
Finished goods.....	\$71,000	
Work in process.....	87,000	
Raw materials.....	<u>73,000</u>	231,000
Prepaid expenses.....		<u>38,000</u>
Total current assets.....		<u><u>\$531,000</u></u>

BRIEF EXERCISE 2-11

**(a) Direct labour costs = prime costs + conversion costs
– total manufacturing costs**

$$\text{Direct labour} = \$195,000 + \$140,000 - \$270,000 = \$65,000$$

Direct material costs = prime costs – direct labour costs

$$\text{Direct material costs} = \$195,000 - \$65,000 = \$130,000$$

Manufacturing overhead costs = conversion costs – direct labour costs

$$\text{Manufacturing overhead costs} = \$140,000 - \$65,000 = \$75,000$$

**(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			

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⁾	

$$(1) \$120,000 + \$136,000 - \$82,000 = \$174,000$$

$$(2) \$321,000 - \$296,000 + \$98,000 = \$123,000$$

$$(3) \$310,000 + \$463,000 - \$715,000 = \$58,000$$

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) \div (10,500 - 8,800) = \1.50 per unit

Fixed cost: $\$18,750 - (\$1.50 \times 10,500 \text{ units}) = \$3,000$

or $\$16,200 - (\$1.50 \times 8,800 \text{ units}) = \$3,000$

(b) Total estimated cost to produce 8,500 units:

= $\$3,000 + (\$1.50 \times 8,500) = \$15,750$

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

SOLUTIONS TO EXERCISES

EXERCISE 2-18

1. (b) Direct 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.

*or sometimes (c), depending on the circumstances

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- Sales commissions.....Period
 line workers.....DL Salaries paid to sales clerks....Period
 Factory supplies used.....MOH
- (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.

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.....	<u>\$170,350</u>
(b) Direct materials.....	\$137,600
Direct labour.....	69,100
Manufacturing overhead.....	170,350
Product costs.....	<u>\$377,050</u>
(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.....	<u>\$69,140</u>

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.

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

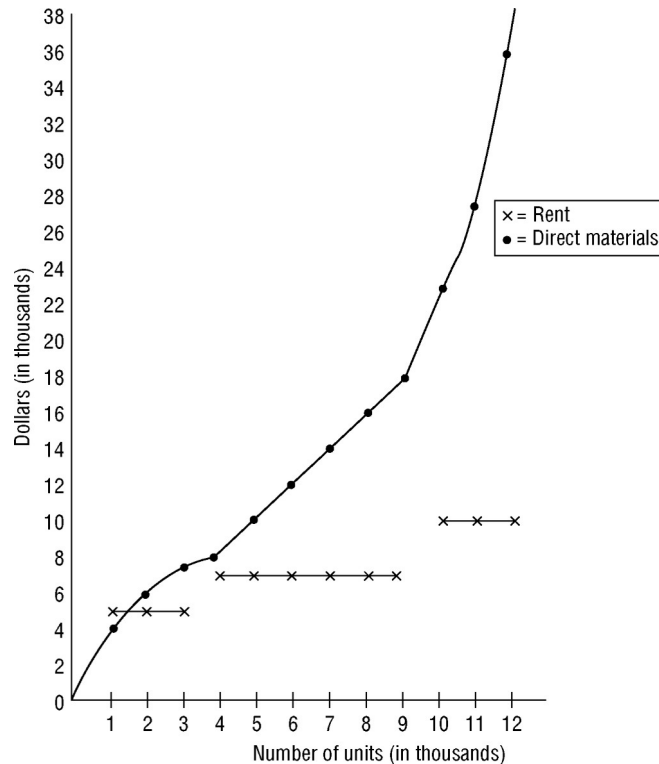
(a) Variable Costs Vary in total directly and proportionately with changes in the activity level but remain constant on a per-unit basis.

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

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)**

$$\begin{aligned}
 &= \frac{\text{Cost}}{\text{Units}} \\
 &= \frac{\$10,000^*}{5,000^*} = \$2 \text{ per unit}
 \end{aligned}$$

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

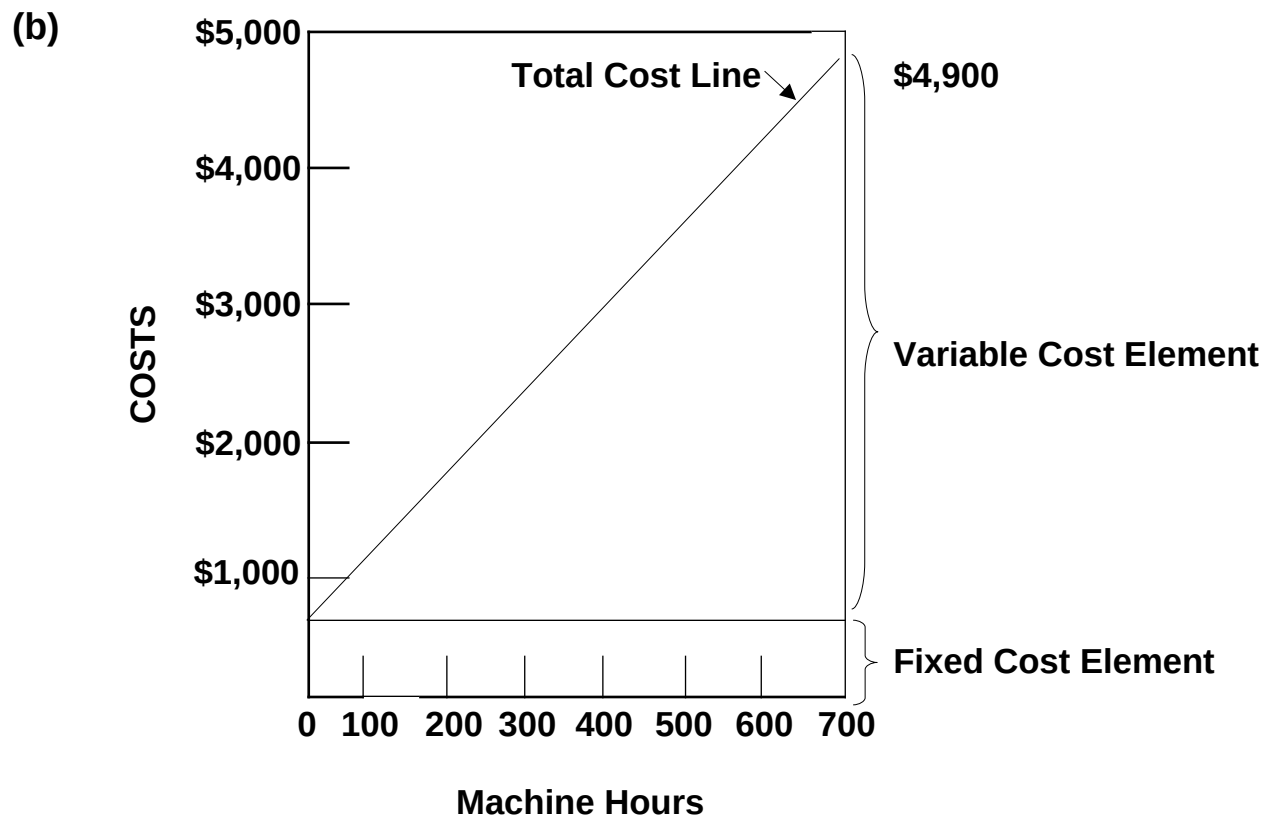
(d) Fixed cost within the relevant range (4,000 to 9,000 units) = \$7,000.

EXERCISE 2-25**(a) Maintenance Costs:**

$$(\$4,900 - \$2,500) \div (700 - 300) = \$2,400 \div 400 = \$6.00 \text{ variable cost per machine hour}$$

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

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



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:**

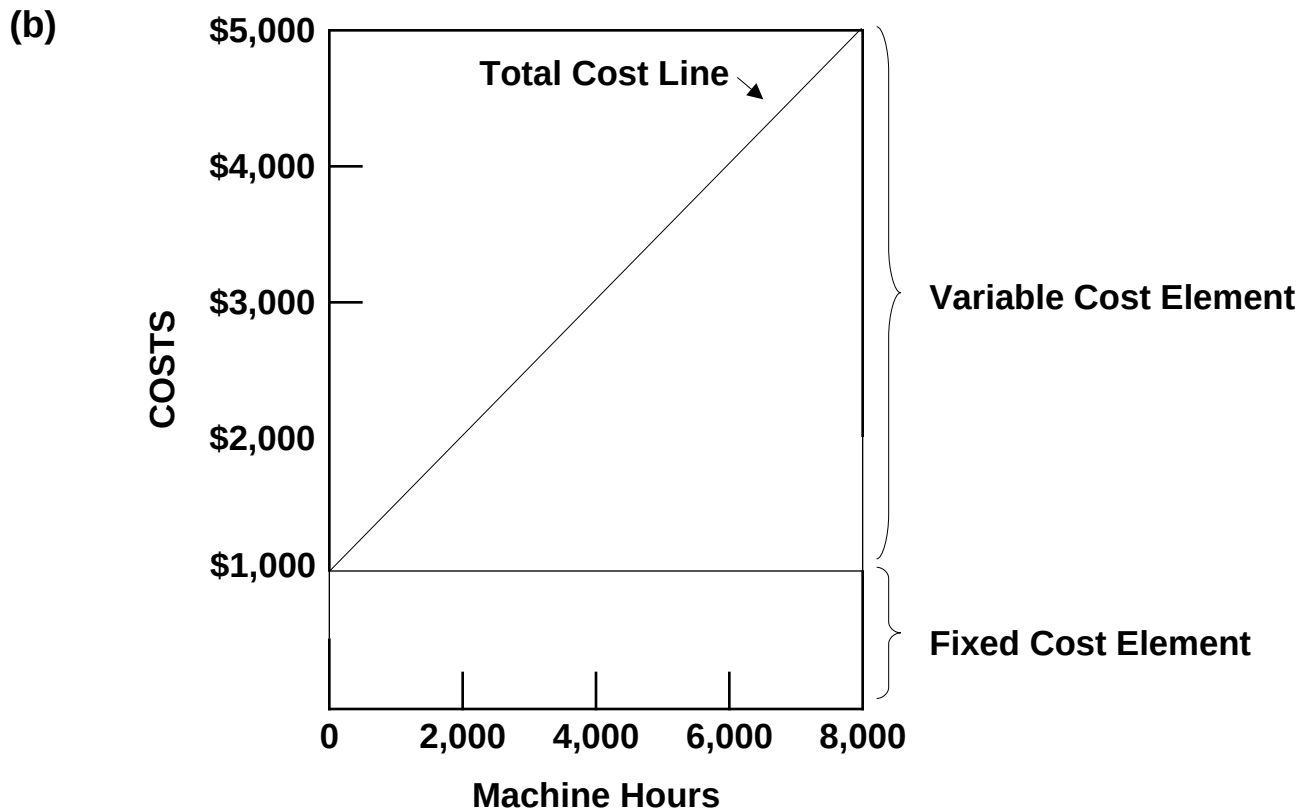
$$\begin{array}{r} \$5,000 \\ 0 \end{array} - \$2,750 = \$2,250$$

$$8,000 - 3,500 = 4,500$$

= \$0.50 variable cost per machine hour

	Activity Level	
	High	Low
Total cost	\$5,000	\$2,750
Less: Variable costs		
8,000 × \$0.50	4,000	
3,500 × \$0.50		1,750
Total fixed costs	<u>\$1,000</u>	<u>\$1,000</u>

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

EXERCISE 2-27 (Continued)**EXERCISE 2-28**

(a)	<u>Cost</u>	<u>Fixed</u>	<u>Variable</u>	<u>Mixed</u>
	Direct materials		X	
	Direct labour		X	
	Utilities			X
	Property taxes	X		
	Indirect labour		X	
	Supervisory salaries	X		
	Maintenance			X
	Depreciation	X		

EXERCISE 2-28 (Continued)

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

Variable cost per unit = $\$27,000 \div 3,000 \text{ units}$
 = $\$9 \text{ per unit}$

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 = $\$1,500 \div 3,000 \text{ units}$
 = $\$0.50 \text{ per unit}$

Maintenance:

Variable cost to produce 3,000 units = $\$1,100 - \200
 = $\$900$

Variable cost per unit = $\$900 \div 3,000 \text{ units}$
 = $\$0.30 \text{ per unit}$

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 = $(\$9.80 \times 5,000) + \$5,700$
 = $\$49,000 + \$5,700$
 = $\$54,700$

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	<u>\$44,100</u>

(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	<u>\$28,790</u>

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	334,000
Total cost of work-in-process.....			344,000
Less: ending work-in-process.....			<u>14,000</u>
Cost of goods manufactured.....			<u>\$330,000</u>
 (b) Finished goods, 1/1.....			 \$ 60,000
Cost of goods manufactured			<u>330,000</u>
Cost of goods available for sale.....			390,000
Finished goods, 12/31.....			<u>50,600</u>
Cost of goods sold.....			<u>\$339,400</u>

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

Calculations:**⁽¹⁾ Total raw materials available for use:**

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

⁽²⁾ Raw materials inventory (1/1):

Raw materials available for use (from ⁽¹⁾).....	\$207,500
Less: Raw materials purchases.....	<u>165,000</u>
Raw materials inventory (1/1).....	<u>\$ 42,500</u>

⁽³⁾ Total cost of work in process:

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

EXERCISE 2-31 (Continued)**(4) Total manufacturing costs:**

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

(5) Direct labour:

Total manufacturing costs.....	\$420,000
Less: Total overhead.....	119,000
Direct materials used.....	<u>190,000</u>
Direct labour.....	<u>\$ 111,000</u>

EXERCISE 2-32

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

$$(a) = \$71,750$$

$$\$252,100 - \$11,000 = (f)$$

$$(f) = \$241,100$$

$$\$175,650 + (b) = \$221,500$$

$$\$102,000 =$$

$$(b) = \$45,850$$

$$\$273,700 - \$130,000 -$$

$$(g) = \$41,700$$

$$\$221,500 - (c) = \$180,725$$

$$(c) = \$40,775$$

$$\$273,700 + (h) = \$335,000$$

$$(h) = \$61,300$$

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

$$(d) = \$236,500$$

$$\$335,000 - \$90,000 = (i)$$

$$(i) = \$245,000$$

$$\$236,500 + \$15,600 = (e)$$

$$(e) = \$252,100$$

Additional explanation to EXERCISE 2-32 solution:

Case A

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

EXERCISE 2-32 (Continued)

(b) Total cost of work in process.....	\$221,500
Less: Total manufacturing costs.....	<u>175,650</u>
Work in process (1/1).....	<u>\$ 45,850</u>
 (c) Total cost of work in process.....	 \$221,500
Less: Cost of goods manufactured.....	<u>180,725</u>
Work in process (12/31).....	<u>\$ 40,775</u>

Case B

(d) Direct materials used.....	\$ 68,400
Direct labour.....	86,500
Manufacturing overhead.....	<u>81,600</u>
Total manufacturing costs.....	<u>\$236,500</u>
 (e) Total manufacturing costs.....	 \$236,500
Work in process (1/1).....	<u>15,600</u>
Total cost of work in process.....	<u>\$252,100</u>
 (f) Total cost of work in process.....	 \$252,100
Cost of goods manufactured.....	<u>\$241,100</u>

Case C

(g) Total manufacturing costs.....	\$273,700
Less: Manufacturing overhead.....	102,000
Direct materials used.....	<u>130,000</u>
Direct labour.....	<u>\$ 41,700</u>
 (h) Total cost of work in process.....	 \$335,000
Less: Total manufacturing costs.....	<u>273,700</u>
Work in process (1/1).....	<u>\$ 61,300</u>
 (i) Total cost of work in process.....	 \$335,000
Cost of goods manufactured.....	<u>\$245,000</u>

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) $\$308,000 + \$45,000 - \$270,000 = \$83,000$

(b)

IKERD COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2016

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

EXERCISE 2-34**(a)**

AIKMAN CORPORATION
Cost of Goods Manufactured Schedule
For the Month Ended June 30, 2016

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.....	<u>400</u>	
Total manufacturing overhead.....	<u>13,300</u>	
Total manufacturing costs.....		<u>68,300</u>
Total cost of work in process.....		71,300
Less: Work in process, June 30.....		<u>2,800</u>
Cost of goods manufactured.....		<u>\$68,500</u>

(b)

AIKMAN CORPORATION
Income Statement (Partial)
For the Month Ended June 30, 2016

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

EXERCISE 2-35**(a)**

DANNER, LETOURNEAU, AND MAJEWSKI
Schedule of Cost of Contract Services Provided
For the Month Ended August 31, 2016

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	<u>3,900</u>
Cost of contract services provided		<u>\$22,000</u>

- (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.....	<u>150,000</u>		
Materials available for use.....	171,000		
Less: Materials inventory, 12/31.....	<u>30,000</u>	\$141,000	
Direct labour.....		220,000	
Manufacturing overhead.....		<u>180,000</u>	
Total manufacturing costs.....			<u>541,000</u>
Total cost of work-in-process.....			554,500
Less: Work-in-process, 12/31.....			<u>17,200</u>
Cost of goods manufactured.....			<u>\$537,300</u>

EXERCISE 2-36 (Continued)

SASSAFRAS COMPANY
Income Statement (Partial)
For the Year Ended December 31, 2016

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

SASSAFRAS COMPANY
(Partial) Balance Sheet
December 31, 2016

(c)	Current assets		
	Inventories		
	Finished goods.....	\$21,000	
	Work in process	17,200	
	Raw materials.....	<u>30,000</u>	\$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.

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) |

¹Only ending inventory is reflected in 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, 2016

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

EXERCISE 2-38 (Continued)**(b)**

KANANASKIS MANUFACTURING
(Partial) Balance Sheet
As at June 30, 2016

Current assets**Inventories**

Finished goods.....	\$ 6,000	
Work in process.....	13,000	
Raw materials.....	<u>13,100</u>	\$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 Sept 30th:

4,600 units were used in manufacturing; 90% in completed autos
 $(4,600 \times 10\%) \times \$8 = \$3,680$

Finished Goods account:

4,600 x 90% completed; 75% of completed autos sold
 $(4,600 \times 90\% \times 25\%) \times \$8 = \$8,280$

Cost of Goods Sold account:

4,600 x 90% completed; 75% of completed autos sold
 $(4,600 \times 90\% \times 75\%) \times \$8 = \$24,840$

Selling Expenses account: $50 \times \$8 = \400

EXERCISE 2-39 (Continued)**Proof of cost of head lamps allocated ($5,000 \times \$8 = \$40,000$)**

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

(b) To: Chief Accountant

From: Student

Subject: Statement Presentation of Accounts

Two accounts will appear in 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 Good 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 which 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.

SOLUTIONS TO PROBLEMS: SET A

PROBLEM 2-40A

(a)

Cost Item	Product Costs			Period Costs
	Direct Materials	Direct Labour	Manufact. Overhead	
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	
	<u>\$20,000</u>	<u>\$55,000</u>	<u>\$17,800</u>	<u>\$13,700</u>

(b) Total production costs

Direct materials	\$20,000
Direct labour	55,000
Manufacturing overhead	<u>17,800</u>
Total production cost	<u>\$92,800</u>

Production cost per helmet = $\$92,800/1,000 = \underline{\underline{\$92.80}}$

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	
Janitorial costs			1,400	
Advertising				\$6,000
Depreciation–factory building (4)			800	
Property taxes–factory building (5)			600	
	<u>\$60,000</u>	<u>\$65,000</u>	<u>\$15,300</u>	<u>\$6,000</u>

- (1) $\$24 \times 2,500 = \$60,000$.
 (2) $\$13 \times 2 \text{ hrs} \times 2,500 = \$65,000$.
 (3) $\$3 \times 2,500 = \$7,500$.
 (4) $\$9,600/12 = \800 .
 (5) $\$7,200/12 = \600 .

(b) Total production costs	
Direct materials	\$ 60,000
Direct labour	65,000
Manufacturing overhead	<u>15,300</u>
Total production cost	<u>\$140,300</u>

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

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)

$$\begin{aligned} \$18,000 \text{ total manufacturing costs} + (h) \text{ beginning work in process} \\ - \$3,000 \text{ ending work in process} = \$22,000 \end{aligned}$$

$$(h) = \$22,000 + \$3,000 - \$18,000 = \$7,000$$

Cost of goods sold = (k)

$$(k) = \$3,300 \text{ beginning inventory} + \$22,000 \text{ Cost of goods manufactured} - \$2,500 \text{ ending inventory} = \$22,800$$

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

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.....	<u>6,000</u>	
Total manufacturing costs.....		<u>15,300</u>
Total cost of work in process.....		16,300
Less: Work in process, ending.....		<u>1,700</u>
Cost of goods manufactured.....		<u><u>\$14,600</u></u>

(c)

CASE 1
Income Statement

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

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.....	<u>700</u>	3,900	
Prepaid expenses.....		<u>200</u>	
Total current assets.....			<u><u>\$17,100</u></u>

PROBLEM 2-43A**(a)****STELLAR MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2016**

Work in process, (1/1).....		\$ 9,500
Direct materials		
Raw materials inventory, (1/1).....	\$ 47,000	
Raw materials purchases.....	<u>62,500</u>	
Total raw materials available		
for use.....	109,500	
Less: Raw materials inventory,		
(12/31).....	<u>44,800</u>	
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.....	<u>800</u>	
Total manufacturing overhead.....		<u>93,800</u>
Total manufacturing costs.....		<u>303,600</u>
Total cost of work in process.....		313,100
Less: Work in process, (12/31).....		<u>7,500</u>
Cost of goods manufactured.....		<u>\$305,600</u>

PROBLEM 2-43A (Continued)

(b) STELLAR MANUFACTURING COMPANY
(Partial) Income Statement
For the Year Ended December 31, 2016

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

(c) STELLAR MANUFACTURING COMPANY
(Partial) Balance Sheet
As at December 31, 2016

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

PROBLEM 2-44A

(a)

TOMBERT COMPANY
Cost of Goods Manufactured Schedule
For the Month Ended October 31, 2016

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

*\$12,000 × 75% = \$9,000

**\$8,000 × 60% = \$4,800

PROBLEM 2-44A (Continued)**(b)**

TOMBERT COMPANY
Income Statement
For the Month Ended October 31, 2016

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

*\$12,000 × 25%

**\$8,000 × 40%

PROBLEM 2-45A

(a) Raw materials inventory, beginning.....	\$ 9,600
Raw material purchased⁽¹⁾.....	<u>28,800</u>
Raw materials available for use.....	38,400
Less: Raw materials inventory, ending.....	<u>10,400</u>
Raw materials used in production	<u><u>\$28,000</u></u>

$$^1 28,000 + \$10,400 = \$38,400$$

$$\$38,400 - \$9,600 = \$28,800$$

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

$$^2 \$14,600 + \$160,000 - \$13,000 = \$161,600$$

(c) Finished goods inventory, beginning.....	\$ 9,600
Cost of goods manufactured.....	<u>161,600</u>
Cost of goods available for sale.....	171,200
Less: finished goods inventory, ending.....	<u>9,200</u>
Cost of goods sold³	<u><u>\$162,000</u></u>

$$^3 \$9,600 + \$161,600 - \$9,200 = \$162,000$$

PROBLEM 2-46A

**(a) Cost of goods sold = manufacturing cost per unit ×
number of units sold**

$$\begin{aligned}\text{Cost of goods sold} &= (\$3,000,000 \div 300,000) \times 298,500 \\ &= \$2,985,000\end{aligned}$$

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

**(c) Cost of finished goods = number of units in inventory ×
per unit product cost**
 $\text{Cost of finished goods} = (300,000 - 298,500) \times \10.00^1
 $= \$15,000$

$$^1\$3,000,000 \div 300,000 = \$10.00 \text{ per unit}$$

PROBLEM 2-47A

(1)(a) Raw materials inventory, beginning	\$18,000
Plus: Raw material purchased	<u>100,000</u>
Raw materials available for use	118,000
Less: Raw materials inventory, ending	<u>18,000</u>
Raw materials used in production	100,000
Less: Indirect material	<u>10,000</u>
Direct material used	<u><u>\$ 90,000</u></u>

(b) Manufacturing costs for the month	\$285,000
Less: Direct material used	90,000
Less: Manufacturing overhead	<u>115,000</u>
Direct labour	<u><u>\$80,000</u></u>

(c) Work in process, beginning	\$ 8,000
Plus: Manufacturing costs for the month	<u>285,000</u>
Total cost of work in process	297,000
Less: Work in process, ending	<u>20,000</u>
Cost of goods manufactured*	<u><u>\$277,000</u></u>

***this is the value of product transferred to finished goods**

- (d) Cost of goods sold + 40% mark-up = Sales**
Sales = 140% × Cost of goods sold
Cost of goods sold = \$420,000 ÷ 1.40 =
\$300,000

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

- (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.**

PROBLEM 2-48A

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

SOLUTIONS TO PROBLEMS: SET B

PROBLEM 2-49B

(a) and (b)

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

(c) Total production costs

Direct materials	\$20,000
Direct labour	54,000
Manufacturing overhead	<u>18,000</u>
Total production cost	<u>\$92,000</u>

Production cost per motorcycle helmet = $\$92,000 \div 1,000 = \92.00

PROBLEM 2-50B

Cost Item	Product Costs			Period Costs
	Direct Materials	Direct Labour	MOH	
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	
Janitorial costs			1,400	
Advertising				\$6,000
Depreciation – factory (4)			700	
Property taxes – factory (5)			600	
	<u>\$57,500</u>	<u>\$65,000</u>	<u>\$15,000</u>	<u>\$6,000</u>

- (1) $\$23 \times 2,500 = \$57,500$.
 (2) $\$13 \times 2 \text{ hours} \times 2,500 = \$65,000$.
 (3) $\$3 \times 2,500 = \$7,500$.
 (4) $\$8,400 \div 12 = \700 .
 (5) $\$7,200 \div 12 = \600 .

(b) Total production costs	
Direct materials	\$ 57,500
Direct labour	65,000
Manufacturing overhead	<u>15,000</u>
Total production cost	<u>\$137,500</u>

Production cost per racket = $\$137,500 \div 2,500 = \55.00 .

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)

$$(k) = \$25,000 - \$2,500 = \$22,500$$

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.....	<u>6,000</u>	
Total manufacturing costs.....		<u>15,300</u>
Total cost of work in process.....		16,300
Less: Work in process, ending.....		<u>500</u>
Cost of goods manufactured.....		<u><u>\$15,800</u></u>

(c)

CASE 1
Income Statement

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

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	
Total current assets.....			<u>\$15,600</u>

PROBLEM 2-52B

(a)

RUIZ MANUFACTURING COMPANY
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2016

Work in process inventory (1/1).			\$ 9,500
Direct materials			
Raw materials inventory (1/1)...	\$ 47,000		
Raw materials purchases.....	<u>62,500</u>		
Raw materials available for use	109,500		
Less: Raw materials inventory.			
(12/31).....	<u>44,200</u>		
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.....	<u>800</u>		
Total manufacturing overhead...		<u>93,000</u>	
Total manufacturing costs. .			<u>303,400</u>
Total cost of work in process.....			312,900
Less: Work in process, (12/31)..			<u>8,000</u>
Cost of goods manufactured.....			<u><u>\$304,900</u></u>

PROBLEM 2-52B (Continued)

(b) RUIZ MANUFACTURING COMPANY
(Partial) Income Statement
For the Year Ended December 31, 2016

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

(c) RUIZ MANUFACTURING COMPANY
(Partial) Balance Sheet
As at December 31, 2016

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

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	<u>488,000</u>
	568,000
– Ending work in process inventory	<u>50,000</u>
	<u><u>\$518,000</u></u>

¹**\$200,000 + \$160,000 + \$128,000**

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

PROBLEM 2-55B

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

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

- (d) Cost of goods sold + 30% mark-up = Sales**
Sales = 130% × CGS
CGS = \$780,000 ÷ 1.30 = \$600,000

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

- (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.**

PROBLEM 2-56B

(a)

AGLER COMPANY
Cost of Goods Manufactured Schedule
For the Month Ended August 31, 2016

Work in process, August 1.....		\$ 25,000
Direct materials		
Raw materials inventory,		
August 1.....	\$ 19,500	
Raw materials purchases.....	<u>200,000</u>	
Total raw materials		
available for use.....	219,500	
Less: Raw materials inventory,		
August 31.....	<u>30,000</u>	
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**.....	<u>3,500</u>	
Total manufacturing overhead		<u>123,500</u>
Total manufacturing costs.....		<u>473,000</u>
Total cost of work in process.....		498,000
Less: Work in process,		
August 31.....		<u>21,000</u>
Cost of goods manufactured.....		<u>\$477,000</u>

*\$10,000 × 50%

**\$5,000 × 70%

PROBLEM 2-56B (Continued)**(b)**

AGLER COMPANY
Income Statement
For the Month Ended August 31, 2016

Sales (net).....		\$675,000
Cost of goods sold		
Finished goods inventory, August 1.....	\$ 40,000	
Cost of goods manufactured.....	<u>477,000</u>	
Cost of goods available for sale.....	517,000	
Less: Finished goods inventory,		
August 31.....	<u>59,000</u>	
Cost of goods sold.....		<u>458,000</u>
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**.....	<u>1,500</u>	
Total operating expenses.....		<u>201,500</u>
Net income.....		<u><u>\$ 15,500</u></u>

* $\$10,000 \times 50\%$ ** $\$5,000 \times 30\%$

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**

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 Material Inventory****EDMI is Ending Direct Materials Inventory****(a) Calculations:**

$$\text{Gross profit} = \$900,000 \times 20\% = \$180,000$$

$$\text{Cost of goods sold} = \$900,000 - \$180,000 = \$720,000$$

$$\text{CON} = \$360,000 + (40\% \times \text{CON})$$

$$(0.6 \times \text{CON}) = \$360,000$$

$$\text{CON} = \$600,000$$

$$\text{FOH} = \$600,000 - \$360,000 = \$240,000$$

$$\text{PRI} = 70\% \times \text{TMC}$$

$$\text{DM} + \text{DL} = 0.70(\text{DM} + \text{DL} + \text{FOH})$$

$$1.0\text{DM} - 0.70\text{DM} = 0.70(\text{DL} + \text{FOH}) - \text{DL}$$

$$0.30\text{DM} = 0.70(\$360,000 + 240,000) - \$360,000$$

$$\text{DM} = \$200,000$$

$$\text{Total manufacturing costs} = \$200,000 + \$360,000 + \$240,000 = \$800,000$$

$$\text{Ending WIP} = 10\% \times \text{TMC} = 0.10 \times \$800,000 = \$80,000$$

$$\text{COGM} = \text{BWIP} + \text{TCM} - \text{EWIP} = \$68,000 + \$800,000 - \$80,000 = \$788,000$$

$$\text{BFI} + \text{COGM} - \text{EFI} = \text{COGS}$$

$$\text{EFI} = \$30,000 + \$788,000 - \$720,000 = \$98,000^{(1)}$$

$$\text{EDMI} = \text{BDMI} + \text{DM Purchases} - \text{DM Used}$$

$$\text{EDMI} = \$32,000 + \$320,000 - \$200,000 = \$152,000$$

PROBLEM 2-58B (Continued)

MEDIUM-SIZED COMPANY
Cost of Goods Manufactured Schedule
For the month ended January 31, 2016

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

(b) Inventories destroyed:

Finished goods	\$98,000 ¹
Work in process	80,000 ³
Direct materials	<u>152,000²</u>
Total	<u><u>\$330,000</u></u>

SOLUTIONS TO CASES

CASE 2-59

Calculations to complete the data for operations in 2016:

Raw materials¹ inventory, beginning	\$13,000
Raw material purchased	<u>13,000</u>
Raw materials available for use	26,000
Direct materials used	<u>20,000</u>
Raw materials inventory, ending	<u>\$ 6,000</u>

¹Assume all raw materials are used as direct materials

Direct materials	\$20,000
Direct labour	25,000
Factory overhead	<u>8,000</u>
Manufacturing costs added during the year	<u>\$53,000</u>

Work in process inventory, beginning	\$ 8,000
Manufacturing costs (see above)	<u>53,000</u>
Total work in process during the year	61,000
Less: Work in process inventory, ending	<u>7,000</u>
Cost of goods manufactured	<u>\$54,000</u>

Finished goods inventory, beginning	\$ 6,000
Plus: Cost of goods manufactured (see above)	<u>54,000</u>
Cost of goods available for sale	60,000
Less: Cost of goods sold	<u>55,000</u>
Finished goods inventory, ending	<u>\$ 5,000</u>

Sales (\$9,000 + \$55,000)	\$64,000
Less: Cost of goods sold (given)	<u>55,000</u>
Gross profit (given)	9,000
Less: Operating expenses (\$9,000 – (\$4,000))	<u>13,000</u>
Operating income (loss)	<u>\$ (4,000)</u>

CASE 2-59 (Continued)

BYDO INC
Cost of Goods Manufactured Schedule
For the Year Ended December 31, 2016

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

BYDO INC
Schedule of Cost of Goods Sold
For the Year Ended December 31, 2016

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

BYDO INC
Income Statement
For the Year Ended December 31, 2016

Sales	\$64,000
Less: Cost of goods sold	<u>55,000</u>

CASE 2-59 (Continued)**9,000****Gross profit****Less: Operating expenses****13,000****Operating income (loss)****\$(4,000)**

CASE 2-60

(a) Direct materials inventory, beginning.....	\$ 6,000
Plus: Direct materials purchased.....	<u>18,000</u>
Direct materials available for use.....	24,000
Less: Direct materials inventory, ending.....	<u>10,000</u>
Direct materials used in production	<u>\$14,000</u>
(b) Finished goods inventory, beginning.....	\$12,000
Plus: Cost of goods manufactured.....	<u>26,500</u>³
Cost of goods available for sale.....	38,500²
Less: Finished goods inventory, ending.....	<u>2,500</u>
Cost of goods sold.....	<u>\$ 36,000</u>¹

¹COGS = 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.....	<u>28,000</u>⁴
Cost of goods available for sale.....	<u>\$40,000</u>
Work in process inventory, beginning.....	\$2,000
Plus: Direct materials used.....	20,000
Plus: Conversion costs.....	<u>22,000</u>
Total cost of work in process.....	44,000
Less: Work in process inventory, ending.....	<u>16,000</u>⁶
Cost of goods manufactured.....	<u>\$28,000</u>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

CASE 2-61

(a)

**Sayers Manufacturing
Cost of Goods Manufactured Schedule
For the Month ended January 31, 2016**

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

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, 2016**

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

CASE 2-62

(a)	Direct costs of production	\$220.00	
	Indirect costs of production	<u>180.00</u>	
	Total costs of production	<u>\$400.00</u>	
(b)	Direct materials, beginning	\$ 50.00	
	Plus: Direct material purchased	<u>140.00</u>	
	Total material available for use	<u>190.00</u>	
	Less: Direct materials, ending	<u>80.00</u>	
	Direct materials used	<u>\$110.00</u>	
(c)	Direct costs of production	\$220.00	
	Less: Direct materials used	<u>110.00</u>	
	Direct labour	<u>\$110.00</u>	
(d)	Total variable costs of production¹	\$280.00	
	Less: direct costs of production	<u>220.00</u>	
	Variable overhead costs	<u>\$ 60.00</u>	
	¹ Includes DM, DL, VOH		
(e)	Total indirect costs of production²	\$180.00	
	Less: variable overhead costs	<u>60.00</u>	
	Fixed manufacturing overhead	<u>\$120.00</u>	
	² Indirect costs are overhead costs – both variable and fixed		
(f)	Work in process, beginning		\$140.00
	Plus: Manufacturing costs		
	Direct material	\$110.00	
	Direct labour	110.00	
	Variable manufacturing overhead	60.00	
	Fixed manufacturing overhead	<u>120.00</u>	<u>400.00</u>
	Total work in process cost		540.00
	Less: Work in process, ending		<u>180.00</u>
	Cost of goods manufactured		<u>\$360.00</u>

CASE 2-62 (Continued)

(g)	Finished goods inventory, beginning	\$240.00
	Plus: Cost of goods manufactured	<u>360.00</u>
	Cost of goods available for sale	600.00
	Less: Finished goods inventory, ending	<u>250.00</u>
	Cost of goods sold	<u><u>\$350.00</u></u>
(h)	Direct Labour	\$110.00
	Variable manufacturing overhead	60.00
	Fixed manufacturing overhead	<u>120.00</u>
	Total conversion costs	<u><u>\$290.00</u></u>
(i)	Direct materials	\$110.00
	Direct labour	<u>110.00</u>
	Total prime costs	<u><u>\$220.00</u></u>
(j)	Period costs =	
	Selling and administrative costs	\$210.00

CASE 2-63

Raw materials inventory, beginning	\$ 19,000
Plus: Raw material purchased	<u>345,000</u>
Raw materials available for use	364,000
Less: Raw materials used in production	<u>350,000</u>
Raw materials inventory, ending	<u><u>\$ 14,000</u></u>

Direct materials	\$350,000
Direct labour	240,000
Factory overhead (\$240,000 × 60%)	<u>144,000</u>
Manufacturing costs added during the year	<u><u>\$734,000</u></u>

Cost of goods available for sale	\$770,000
Less: finished goods inventory, beginning	<u>38,000</u>
Cost of goods manufactured	<u><u>\$732,000</u></u>

Work in process inventory, beginning	\$ 25,000
Manufacturing costs	<u>734,000</u>
Total work in process during the year	759,000
Less: Cost of goods manufactured	<u>732,000</u>
Work in process inventory, ending	<u><u>\$ 27,000</u></u>

Sales	\$1,260,000
Less: Gross profit (\$1,260,000 × 40%)	<u>504,000</u>
Cost of goods sold	<u><u>\$ 756,000</u></u>

Cost of goods available for sale	\$770,000
Less: cost of goods sold	<u>756,000</u>
Finished goods inventory, ending	<u><u>\$ 14,000</u></u>

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.

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 plant or consolidating activities to one location in plant**
 - **Subletting a portion of the plant**
 - **Closing 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**

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—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—payment to plant manager			X	
Dana Schultz (kayak assembler)	Payroll—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	

SOLUTION TO WATERWAYS CONTINUING PROBLEM WCP-2

(a) Direct labour:

$$(\$176,000 - \$148,000) \div (\$32,000 - \$24,000) = 350\%$$

	<u>Activity Level</u>	
	<u>High</u>	<u>Low</u>
Total cost	\$176,000	\$148,000
Less: Variable costs		
32,000 × 350%	112,000	
24,000 × 350%		84,000
Total fixed costs	<u>\$ 64,000</u>	<u>\$ 64,000</u>

The cost formula is: $\$64,000 + 3.50X$.

Hours of Operation:

$$(\$170,000 - \$145,000) \div (700 - 500) = \$125 \text{ per hour}$$

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

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

WCP-2 (Continued)

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

$$\text{\$70,000} \times (100\% - 60\%) = \text{\$28,000}.$$

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

$$\text{Labour dollars: } \text{\$64,000} + (3.5 \times \text{\$28,000}) = \text{\$162,000}$$

$$\text{Hours of operation: } \text{\$82,500} + (\text{\$125} \times 600) = \text{\$157,500}$$

Actual manufacturing overhead for the month has to be calculated as follows:

Total manufacturing costs (given)		\$315,000
Less: Direct material ⁽¹⁾	\$132,000	
Direct labour ⁽²⁾	28,000	160,000
Manufacturing overhead		<u>\$155,000</u>

⁽¹⁾ Direct Material

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	<u>\$132,000</u>

⁽²⁾ Total salaries and wages

Less: Indirect wages (60%)	\$70,000
Direct labour used in production	42,000
	<u>\$28,000</u>

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.

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

⁽³⁾ Work in process, ending

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

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