

Question 1 Answer

A) Variable component of cost of goods sold:

Variable rate = Change in costs ÷ Change in units

Variable rate = $(\$750,000 - \$600,000) \div (80,000 - 60,000)$

Variable rate = \$7.50 per unit

Fixed component of cost of goods sold:

High units: $\$750,000 - \$7.50(80,000) = \$150,000$

Low units: $\$600,000 - \$7.50(60,000) = \$150,000$

Variable component of operating expenses:

Variable rate = Change in costs ÷ Change in units

Variable rate = $(\$180,000 - \$150,000) \div (80,000 - 60,000)$

Variable rate = \$1.50 per unit

Fixed component of cost of goods sold:

High units: $\$180,000 - \$1.50(80,000) = \$60,000$

Low units: $\$150,000 - \$1.50(60,000) = \$60,000$

Total variable cost per unit:

$\$7.50 + \$1.50 = \$9.00$ per unit

Total fixed cost:

$\$150,000 + \$60,000 = \$210,000$

B)

Sales Revenue		1,200,000
Variable Expenses:		
Variable cost of goods sold (7.5 x 80,000)	600,000	
Variable operating expenses (1.5 x 80,000)	120,000	720,000
Contribution margin		<u>480,000</u>

Question 2 Answer

a) Contribution margin ratio = $\$30,000 / \$75,000 = 0.40$

$\$36,000 / 0.40 = \$90,000$ break-even sales

$\$90,000 / \$15 = 6,000$ units to break even

b) Variable expense ratio = $\$45,000 / \$75,000 = 0.60$

$\$90,000$ sales x 60% variable expense ratio = $\$54,000$

c) $(\$36,000 + \$9,000) / 0.40 = \$112,500$

$\$112,500 / \$15 = 7,500$ units

d) Increased contribution margin ($25,000 \times 0.40$)	10,000
Less: increased advertising cost	<u>6,000</u>
Incremental net income	<u><u>4,000</u></u>

Yes, the advertising budget should be increased!

Question 3 Answer

(a.) Cost per unit under absorption costing:

Direct materials	\$190.00
Direct labour	40.00
Variable overhead	25.00
Fixed overhead (\$250,000 ÷ 20,000)	<u>12.50</u>
Total cost per unit	<u>\$267.50</u>

Cost per unit under variable costing:

Direct materials	\$190.00
Direct labour	40.00
Variable overhead	<u>25.00</u>
Total cost per unit	<u>\$255.00</u>

Ending inventory = beg. Inventory + units produced – units sold = 0 + 20,000 – 19,000 = 1,000

(b) Absorption costing income statement:

Sales		\$6,650,000
Costs of goods sold:		
Beginning inventory	\$0	
Costs of good manufactured (20,000 @ \$267.50)	<u>5,350,000</u>	
Goods available for sale	5,350,000	
Less ending inventory (1,000 units @ \$267.50)	267,500	<u>5,082,500</u>
Gross profit		1,567,500
Less selling and administrative expense: [(\$10 x 19,000) + \$225,000]		<u>415,000</u>
Operating Income		<u>\$1,152,500</u>

(c.) Variable costing income statement

Sales		\$6,650,000
Cost of goods sold:		
Beginning inventory	\$0	
Cost of goods manufactured (20,000 @ \$255)	<u>5,100,000</u>	
Cost of goods available	5,100,000	
Less ending inventory (1,000 @ \$255)	<u>255,000</u>	
Variable cost of goods sold	4,845,000	
Variable selling and admin expense (19,000 x \$10)	<u>190,000</u>	<u>5,035,000</u>
Contribution margin		1,615,000
Less fixed expense:		
Manufacturing overhead	250,000	
Selling and administrative	<u>225,000</u>	<u>475,000</u>
Operating income		<u>\$1,140,000</u>

(d).

Operating income under variable costing	\$1,140,000
Add fixed manufacturing overhead cost deferred in inventory under absorption costing (1,000 x \$12.5)	<u>12,500</u>
Operating income under absorption costing	<u>\$1,152,500</u>

Question 4 Answer

Direct materials	40,000
Direct labour	39,000
Overhead	20,000
Beginning work in process	?
Less: ending work in process	<u>4,000</u>
Cost of goods manufactured	105,000

$$\text{Beg. WIP} = 105,000 + 4,000 - 20,000 - 39,000 - 40,000 = 10,000$$

Beginning finished goods inventory	12,000
Add: Cost of goods manufactured	105,000
Less: Ending finished goods inventory	<u>?</u>
Cost of goods sold	110,000

$$\text{Ending finished goods inventory} = 12,000 + 105,000 - 110,000 = 7,000$$

Question 5 Answer

a) Direct materials	4,000
Direct labour	1,500
Overhead (300* x \$2.50**)	<u>750</u>
Total	<u><u>6,250</u></u>

* $\$1,500 \div \$5.00/\text{DLH} = 300 \text{ DLH}$

** $\$50,000 \div 20,000 \text{ DLH} = \$2.50/\text{DLH}$

Unit cost = $6,250/100 \text{ units} = \62.50

b) Actual overhead cost	54,000
Applied overhead	<u>60,000</u>
Over-applied overhead	<u><u>(6,000)</u></u>

Question 6 Answer

The overhead rates for each activity centre are as follows:

Activity	Estimated Overhead Costs	Expected Activity	Overhead Rate
Machine setups	\$10,800	180	\$60.00
Purchase orders	\$77,520	1,520	\$51.00
General factory	\$75,920	5,840	\$13.00

The overhead cost charged to each product is:

	Product F		Product G	
	Activity	Amount	Activity	Amount
Machine setups	80	\$ 4,800	100	\$ 6,000
Purchase orders	510	26,010	1,010	51,510
General factory	2,240	<u>29,120</u>	3,600	<u>46,800</u>
Total overhead cost		<u>\$59,930</u>		<u>\$104,310</u>

(eg. Machine setups for Product F = 80 x \$60 = 4,800)

Overhead cost per unit:

Product F: $\$59,930 / 1,400 \text{ units} = \42.81 per unit.

Product G: $\$104,310 / 1,800 \text{ units} = \57.95 per unit.

OR

	Product F	Product G	Total
Machine setups	$80/180 \times 10,800 = 4,800$	$100/180 \times 10,800 = 6,000$	10,800
Purchase orders	$510/1,520 \times 77,520 = 26,010$	$1,010/1,520 \times 77,520 = 51,510$	77,520
General factory	$2,240/5,840 \times 75,920 = \underline{29,120}$	$3,600/5,840 \times 75,920 = \underline{46,800}$	<u>75,920</u>
Total	59,930	104,310	164,240

Overhead cost per unit:

Product F: $\$59,930 / 1,400 \text{ units} = \42.81 per unit.

Product G: $\$104,310 / 1,800 \text{ units} = \57.95 per unit.

Question 7 Answer

Total cost at high level of activity: $132,000 \times \$0.09 = \$11,880$

Total cost at low level of activity: $72,000 \times \$0.105 = \$7,560$

	<u>Activity</u>	<u>Cost</u>
High	132,000	\$11,880
Low	<u>72,000</u>	<u>7,560</u>
Change	<u>60,000</u>	<u>\$4,320</u>

Variable cost = $\text{Change in cost} \div \text{Change in activity}$
 $= 4,320 \div 60,000$
 $= \$0.072 \text{ per kilometer}$

Fixed cost element = $\$11,880 - (\$0.072 \times 132,000)$
 $= \$2,376$

OR

Fixed cost element = $\$7,560 - (\$0.072 \times 72,000)$
 $= \$2,376$

Total cost = $0.072d + 2,376$ (where d represents the distance driven in KM)