Variable Costing and Segment Reporting: Tools for Management

Exercises & solutions

Raleigh Company segments its business into two regions—East and West. The company prepared the contribution format segmented income statement as shown below:

	Total Company	East	West
Sales	$ 1,050,000	$ 600,000	$ 450,000
Variable expenses	495,000	360,000	135,000
Contribution margin	555,000	240,000	315,000
Traceable fixed expenses	123,000	60,000	63,000
Segment margin	432,000	$ 180,000	$ 252,000
Common fixed expenses	185,000		
Net operating income	$ 247,000		

Required:

1. Compute the companywide break-even point in dollar sales.
2. Compute the break-even point in dollar sales for the East Region.
3. Compute the break-even point in dollar sales for the West Region.

[Ex.01]

Requirement 1: Compute the companywide break-even point in dollar sales.

$$\begin{matrix}\textit{Dollar sales for company} \\ \textit{to break even}\end{matrix} = \frac{\textit{Traceable fixed expenses} + \textit{Common fixed expenses}}{\textit{Overall CM ratio}}$$

$$= \frac{\$123{,}000 + \$185{,}000}{0.529}$$

$$= \$582{,}231$$

Requirement 2: Compute the break-even point in dollar sales for the East Region.

$$\begin{matrix}\textit{Dollar sales for segment} \\ \textit{to break even}\end{matrix} = \frac{\textit{Segment traceable fixed expenses}}{\textit{Segment CM ratio}}$$

$$= \frac{\$60{,}000}{0.4}$$

$$= \$150{,}000$$

Requirement 3: Compute the break-even point in dollar sales for the West Region.

$$\begin{matrix}\textit{Dollar sales for segment} \\ \textit{to break even}\end{matrix} = \frac{\textit{Segment traceable fixed expenses}}{\textit{Segment CM ratio}}$$

$$= \frac{\$63{,}000}{0.7} = \$90{,}000$$

Wentzel Company manufactures and sells one product. The following information pertains to each of the company's first two years of operations:

Variable costs per unit:	
Manufacturing:	
Direct materials	$15
Direct labor	$10
Variable manufacturing overhead	$7
Variable selling and administrative	$1

Fixed costs per year:	
Fixed manufacturing overhead	**$525,000**
Fixed selling and administrative	$110,000

During its first year of operations, Wentzel produced 75,000 units and sold 60,000 units. During its second year of operations, it produced 60,000 units and sold 75,000 units. The selling price of the company's product is $58 per unit.

Required:

1. Assume that the company uses variable costing:
   a. Compute the unit product cost for Year 1 and Year 2.
   b. Prepare an income statement for Year 1 and Year 2.
2. Assume that the company uses absorption costing:
   a. Compute the unit product cost for Year 1 and Year 2.
   b. Prepare an income statement for Year 1 and Year 2.
3. Explain the difference between variable costing and absorption costing net operating income in Year 1. Also, explain why the two net operating incomes differ in Year 2.

[Ex.02]

Requirement 1: Assume that the company uses variable costing. Compute the unit product cost and prepare an income statement.

	Year 1	Year 2
Direct materials	$15	$15
Direct labor	10	10
Variable manufacturing overhead	7	7
Variable costing unit product cost	$32	$32

	Year 1	Year 2
Sales	$3,480,000	$4,350,000
Variable expenses:		
Variable cost of goods sold	1,920,000	2,400,000
Variable selling expense	60,000	75,000
Contribution margin	1,500,000	1,875,000
Fixed expenses:		
Fixed manufacturing overhead	525,000	525,000
Fixed selling and administrative expense	110,000	110,000
Net operating income	$865,000	$1,240,000

Requirement 2: Assume that the company uses absorption costing. Compute the unit product cost and prepare an income statement.

	Year 1	Year 2
Direct materials	$ 15.00	$ 15.00
Direct labor	10.00	10.00
Variable manufacturing overhead	7.00	7.00
Fixed manufacturing overhead	7.00	8.75
Absorption costing unit product cost	$ 39.00	$ 40.75

	Year 1	Year 2
Sales	$ 3,480,000	$ 4,350,000
Cost of goods sold	2,340,000	3,056,250
Gross margin	1,140,000	1,293,750
Selling and administrative expenses	170,000	185,000
Net operating income	$ 970,000	$ 1,118,750

***Requirement 3**:* Explain the difference between variable costing and absorption costing net operating income in Year 1. Also, explain why the two net operating incomes differ in Year 2.

		year 1	year 2
	units in beginning inventory	$0	$15.000
+	units produced	$75.000	$60.000
-	units sold	$60.000	$75.000
=	units in ending inventory	$15.000	$0

Fixed manufacturing overhead in ending inventory (15,000 × $7/unit)	$105.000	$0
Deduct: Fixed manufacturing overhead in beginning inventory (15,000 × $8,75/unit)	$0	$131.250
Manufacturing overhead deferred in (released from) inventory	$105.000	-$131.250

	year 1	year 2
Variable costing net operating income	$865.000	$1.240.000
Add: Fixed manufacturing overhead cost deferred in inventory under absorption costing	$105.000	
Deduct: Fixed manufacturing overhead cost released from inventory under absorption costing	$0	$131.250
Absorption costing net operating income	$970.000	$1.371.250

Wilson Company segments its business into two regions—North and South. The company prepared the contribution format segmented income statement as shown below:

	Total Company	North	South
Sales	$ 650,000	$ 400,000	$ 250,000
Variable expenses	315,000	240,000	75,000
Contribution margin	335,000	160,000	175,000
Traceable fixed expenses	123,000	60,000	63,000
Segment margin	212,000	$ 100,000	$ 112,000
Common fixed expenses	89,000		
Net operating income	$ 123,000		

Required:

1. Compute the companywide break-even point in dollar sales.
2. Compute the break-even point in dollar sales for the North Region.
3. Compute the break-even point in dollar sales for the South Region.
4. Prepare a new segmented income statement based on the break-even dollar sales that you computed in requirements 2 and 3. What is Wilson's net income (loss) in your new segmented income statement?

[Ex.03]

Requirement 1: Compute the companywide break-even point in dollar sales.

$$\begin{gathered}\text{Dollar sales for company}\\ \text{to break even}\end{gathered} = \frac{\text{Traceable fixed expenses} + \text{Common fixed expenses}}{\text{Overall CM ratio}}$$

$$= \frac{\$123{,}000 + \$89{,}000}{0.515}$$

$$= \$411{,}650$$

Requirement 2: Compute the break-even point in dollar sales for the North Region.

$$\begin{gathered}\text{Dollar sales for segment}\\ \text{to break even}\end{gathered} = \frac{\text{Segment traceable fixed expenses}}{\text{Segment CM ratio}}$$

$$= \frac{\$60{,}000}{0.4} = \$150{,}000$$

Requirement 3: Compute the break-even point in dollar sales for the South Region.

$$\begin{gathered}\text{Dollar sales for segment}\\ \text{to break even}\end{gathered} = \frac{\text{Segment traceable fixed expenses}}{\text{Segment CM ratio}}$$

$$= \frac{\$63{,}000}{0.7} = \$90{,}000$$

Requirement 4: Prepare a new segmented income statement based on the break-even dollar sales that you computed in requirements 2 and 3. What is Wilson's net income (loss) in your new segmented income statement?

		Divisions	
	Total Company	North	South
	Amount	Amount	Amount
Sales	$240,000	$150,000	$90,000
Variable expenses	117,000	90,000	27,000
Contribution margin	123,000	60,000	63,000
Traceable fixed expenses	123,000	60,000	63,000
Territorial segment margin	0	$ 0	$ 0
Common fixed expenses	89,000		
Net operating loss	($89,000)		