REVIEW PROBLEM 1: CONTRASTING VARIABLE AND ABSORPTION COSTING

Dexter Corporation produces and sells a single product, a wooden hand loom for weaving small items such as scarves. Selected cost and operating data relating to the product for two years are given below:

Selling price per unit	$50
Manufacturing costs:	
Variable per unit produced:	
Direct materials	$11
Direct labor	$6
Variable manufacturing overhead	$3
Fixed manufacturing overhead per year	$120,000
Selling and administrative expenses:	
Variable per unit sold	$4
Fixed per year	$70,000

	Year 1	Year 2
Units in beginning inventory	0	2,000
Units produced during the year	10,000	6,000
Units sold during the year	8,000	8,000
Units in ending inventory	2,000	0

Required:

1. Assume the company uses absorption costing.
   a. Compute the unit product cost in each year.
   b. Prepare an income statement for each year.
2. Assume the company uses variable costing.
   a. Compute the unit product cost in each year.
   b. Prepare an income statement for each year.
3. Reconcile the variable costing and absorption costing net operating incomes.

Solution to Review Problem 1

1. a. Under absorption costing, all manufacturing costs, variable and fixed, are included in unit product costs:

	Year 1	Year 2
Direct materials	$11	$11
Direct labor	6	6
Variable manufacturing overhead	3	3
Fixed manufacturing overhead		
($120,000 ÷ 10,000 units)	12	
($120,000 ÷ 6,000 units)		20
Absorption costing unit product cost	$32	$40

b. The absorption costing income statements follow:

	Year 1	Year 2
Sales (8,000 units × $50 per unit)	$400,000	$400,000
Cost of goods sold (8,000 units × $32 per unit); (2,000 units × $32 per unit) + (6,000 units × $40 per unit)	256,000	304,000
Gross margin	144,000	96,000
Selling and administrative expenses (8,000 units × $4 per unit + $70,000)	102,000	102,000
Net operating income (loss)	$ 42,000	$ (6,000)

2. a. Under variable costing, only the variable manufacturing costs are included in unit product costs:

	Year 1	Year 2
Direct materials	$11	$11
Direct labor	6	6
Variable manufacturing overhead	3	3
Variable costing unit product cost	$20	$20

b. The variable costing income statements follow:

	Year 1		Year 2	
Sales (8,000 units × $50 per unit)		$400,000		$400,000
Variable expenses:				
Variable cost of goods sold (8,000 units × $20 per unit)	$160,000		$160,000	
Variable selling and administrative expenses (8,000 units × $4 per unit)	32,000	192,000	32,000	192,000
Contribution margin		208,000		208,000
Fixed expenses:				
Fixed manufacturing overhead	120,000		120,000	
Fixed selling and administrative expenses	70,000	190,000	70,000	190,000
Net operating income		$ 18,000		$ 18,000

3. The reconciliation of the variable and absorption costing net operating incomes follows:

	Year 1	Year 2
Variable costing net operating income	$18,000	$ 18,000
Add fixed manufacturing overhead costs deferred in inventory under absorption costing (2,000 units × $12 per unit)	24,000	
Deduct fixed manufacturing overhead costs released from inventory under absorption costing (2,000 units × $12 per unit)		(24,000)
Absorption costing net operating income (loss)	$42,000	$ (6,000)

REVIEW PROBLEM 2: SEGMENTED INCOME STATEMENTS

The business staff of the law firm Frampton, Davis & Smythe has constructed the following report which breaks down the firm's overall results for last month into two business segments—family law and commercial law:

	Total	Family Law	Commercial Law
Revenues from clients	$1,000,000	$400,000	$600,000
Variable expenses	220,000	100,000	120,000
Contribution margin	780,000	300,000	480,000
Traceable fixed expenses	670,000	280,000	390,000
Segment margin	110,000	20,000	90,000
Common fixed expenses	60,000	24,000	36,000
Net operating income (loss)	$ 50,000	$ (4,000)	$ 54,000

However, this report is not quite correct. The common fixed expenses such as the managing partner's salary, general administrative expenses, and general firm advertising have been allocated to the two segments based on revenues from clients.

Required:

1. Redo the segment report, eliminating the allocation of common fixed expenses. Would the firm be better off financially if the family law segment were dropped? (Note: Many of the firm's commercial law clients also use the firm for their family law requirements such as drawing up wills.)
2. The firm's advertising agency has proposed an ad campaign targeted at boosting the revenues of the family law segment. The ad campaign would cost $20,000, and the advertising agency claims that it would increase family law revenues by $100,000. The managing partner of Frampton, Davis & Smythe believes this increase in business could be accommodated without any increase in fixed expenses. Estimate the effect this ad campaign would have on the family law segment margin and on the firm's overall net operating income.

Solution to Review Problem 2

1. The corrected segmented income statement appears below:

	Total	Family Law	Commercial Law
Revenues from clients	$1,000,000	$400,000	$600,000
Variable expenses	220,000	100,000	120,000
Contribution margin	780,000	300,000	480,000
Traceable fixed expenses	670,000	280,000	390,000
Segment margin	110,000	$ 20,000	$ 90,000
Common fixed expenses	60,000		
Net operating income	$ 50,000		

No, the firm would not be financially better off if the family law practice were dropped. The family law segment is covering all of its own costs and is contributing $20,000 per month to covering the common fixed expenses of the firm. While the segment margin for family law is much lower than for commercial law, it is still profitable. Moreover, family law may be a service that the firm must provide to its commercial clients in order to remain competitive.

2. The ad campaign can be estimated to increase the family law segment margin by $55,000 as follows:

Increased revenues from clients	$100,000
Family law contribution margin ratio ($300,000 ÷ $400,000)	× 75%
Incremental contribution margin	$ 75,000
Less cost of the ad campaign	20,000
Increased segment margin	$ 55,000

Because there would be no increase in fixed expenses (including common fixed expenses), the increase in overall net operating income is also $55,000.

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Diego Company manufactures one product that is sold for $80 per unit in two geographic regions—the East and West regions. The following information pertains to the company's first year of operations in which it produced 40,000 units and sold 35,000 units.

Variable costs per unit:	
Manufacturing:	
Direct materials	$24
Direct labor	$14
Variable manufacturing overhead	$2
Variable selling and administrative	$4
Fixed costs per year:	
Fixed manufacturing overhead	$800,000
Fixed selling and administrative expenses	$496,000

The company sold 25,000 units in the East region and 10,000 units in the West region. It determined that $250,000 of its fixed selling and administrative expenses is traceable to the West region, $150,000 is traceable to the East region, and the remaining $96,000 is a common fixed cost. The company will continue to incur the total amount of its fixed manufacturing overhead costs as long as it continues to produce any amount of its only product.

Required:

Answer each question independently based on the original data unless instructed otherwise. You do not need to prepare a segmented income statement until question 13.

1. What is the unit product cost under variable costing?
2. What is the unit product cost under absorption costing?
3. What is the company's total contribution margin under variable costing?
4. What is the company's net operating income under variable costing?
5. What is the company's total gross margin under absorption costing?
6. What is the company's net operating income under absorption costing?
7. What is the amount of the difference between the variable costing and absorption costing net operating incomes? What is the cause of this difference?
8. What is the company's break-even point in unit sales? Is it above or below the actual sales volume? Compare the break-even sales volume to your answer for question 6 and comment.
9. If the sales volumes in the East and West regions had been reversed, what would be the company's overall break-even point in unit sales?
10. What would have been the company's variable costing net operating income if it had produced and sold 35,000 units? You do not need to perform any calculations to answer this question.
11. What would have been the company's absorption costing net operating income if it had produced and sold 35,000 units? You do not need to perform any calculations to answer this question.
12. If the company produces 5,000 fewer units than it sells in its second year of operations, will absorption costing net operating income be higher or lower than variable costing net operating income in Year 2? Why? No calculations are necessary.
13. Prepare a contribution format segmented income statement that includes a Total column and columns for the East and West regions.
14. Diego is considering eliminating the West region because an internally generated report suggests the region's total *gross margin* in the first year of operations was $50,000 less than its traceable fixed sellingand administrative expenses. Diego believes that if it drops the West region, the East region's sales will grow by 5% in Year 2. Using the contribution approach for analyzing segment profitability and assuming all else remains constant in Year 2, what would be the profit impact of dropping the West region in Year 2?
15. Assume the West region invests $30,000 in a new advertising campaign in Year 2 that increases its unit sales by 20%. If all else remains constant, what would be the profit impact of pursuing the advertising campaign?

EXERCISE 6–14 Working with a Segmented Income Statement [LO4]
Marple Associates is a consulting firm that specializes in information systems for construction and landscaping companies. The firm has two offices—one in Houston and one in Dallas. The firm classifies the direct costs of consulting jobs as variable costs. A segmented contribution format income statement for the company's most recent year is given below:

			Office			
	Total Company		Houston		Dallas	
Sales	$750,000	100.0%	$150,000	100%	$600,000	100%
Variable expenses	405,000	54.0	45,000	30	360,000	60
Contribution margin	345,000	46.0	105,000	70	240,000	40
Traceable fixed expenses	168,000	22.4	78,000	52	90,000	15
Office segment margin	177,000	23.6	$ 27,000	18%	$150,000	25%
Common fixed expenses not traceable to offices	120,000	16.0				
Net operating income	$ 57,000	7.6%				

Required:

1. By how much would the company's net operating income increase if Dallas increased its sales by $75,000 per year? Assume no change in cost behavior patterns.
2. Refer to the original data. Assume that sales in Houston increase by $50,000 next year and that sales in Dallas remain unchanged. Assume no change in fixed costs.

   a. Prepare a new segmented income statement for the company using the above format. Show both amounts and percentages.

   b. Observe from the income statement you have prepared that the CM ratio for Houston has remained unchanged at 70% (the same as in the above data) but that the segment margin ratio has changed. How do you explain the change in the segment margin ratio?

PROBLEM 6–17A Variable and Absorption Costing Unit Product Costs and Income Statements [LO1 , LO2]
Nickelson Company manufactures and sells one product. The following information pertains to each of the company's first three years of operations:

Variable costs per unit:	
Manufacturing:	
Direct materials	$25
Direct labor	$16
Variable manufacturing overhead	$5
Variable selling and administrative	$2
Fixed costs per year:	
Fixed manufacturing overhead	$300,000
Fixed selling and administrative expenses	$180,000

During its first year of operations Nickelson produced 60,000 units and sold 60,000 units. During its second year of operations it produced 75,000 units and sold 50,000 units. In its third year, Nickelson produced 40,000 units and sold 65,000 units. The selling price of the company's product is $56 per unit.

Required:

1. Compute the company's break-even point in units sold.
2. Assume the company uses variable costing:

   a. Compute the unit product cost for Year 1, Year 2, and Year 3.

   b. Prepare an income statement for Year 1, Year 2, and Year 3.
3. Assume the company uses absorption costing:

   a. Compute the unit product cost for Year 1, Year 2, and Year 3.

b. Prepare an income statement for Year 1, Year 2, and Year 3.

4. Compare the net operating income figures that you computed in requirements 2 and 3 to the break-even point that you computed in requirement 1. Which net operating income figures seem counterintuitive? Why?

PROBLEM 6–18A Variable Costing Income Statement; Reconciliation[LO2, LO3]

During Denton Company's first two years of operations, the company reported absorption costing net operating income as follows:

	Year 1	Year 2
Sales (@ $50 per unit)	$1,000,000	$1,500,000
Cost of goods sold (@ $34 per unit)	680,000	1,020,000
Gross margin	320,000	480,000
Selling and administrative expenses*	310,000	340,000
Net operating income	$ 10,000	$ 140,000

*$3 per unit variable; $250,000 fixed each year.

The company's $34 unit product cost is computed as follows:

Direct materials	$ 8
Direct labor	10
Variable manufacturing overhead	2
Fixed manufacturing overhead ($350,000 ÷ 25,000 units)	14
Absorption costing unit product cost	$34

Production and cost data for the two years are given below:

	Year 1	Year 2
Units produced	25,000	25,000
Units sold	20,000	30,000

Required:

1. Prepare a variable costing contribution format income statement for each year.
2. Reconcile the absorption and variable costing net operating income figures for each year.

PROBLEM 6–21A Absorption and Variable Costing; Production Constant, Sales Fluctuate [LO1 , LO2, LO3]

Sandi Scott obtained a patent on a small electronic device and organized Scott Products, Inc., to produce and sell the device. During the first month of operations, the device was very well received on the market, so Ms. Scott looked forward to a healthy profit. For this reason, she was surprised to see a loss for the month on her income statement. This statement was prepared by her accounting service, which takes great pride in providing its clients with timely financial data. The statement follows:

Scott Products, Inc.
Income Statement

Sales (40,000 units)		$200,000
Variable expenses:		
Variable cost of goods sold	$80,000	
Variable selling and administrative expenses	30,000	110,000
Contribution margin		90,000
Fixed expenses:		
Fixed manufacturing overhead	75,000	
Fixed selling and administrative expenses	20,000	95,000
Net operating loss		$ (5,000)

Ms. Scott is discouraged over the loss shown for the month, particularly because she had planned to use the statement to encourage investors to purchase stock in the new company. A friend, who is a CPA, insists that the company should be using absorption costing rather than variable costing. He argues that if absorption costing had been used, the company would probably have reported a profit for the month.

Selected cost data relating to the product and to the first month of operations follow:

Units produced	50,000
Units sold	40,000
Variable costs per unit:	
Direct materials	$1.00
Direct labor	$0.80
Variable manufacturing overhead	$0.20
Variable selling and administrative expenses	$0.75

Required:

1. Complete the following:
   a. Compute the unit product cost under absorption costing.
   b. Redo the company's income statement for the month using absorption costing.
   c. Reconcile the variable and absorption costing net operating income (loss) figures.
2. Was the CPA correct in suggesting that the company really earned a "profit" for the month? Explain.
3. During the second month of operations, the company again produced 50,000 units but sold 60,000 units. (Assume no change in total fixed costs.)
   a. Prepare a contribution format income statement for the month using variable costing.
   b. Prepare an income statement for the month using absorption costing.
   c. Reconcile the variable costing and absorption costing net operating incomes.

PROBLEM 6–22A Restructuring a Segmented Income Statement [LO4]

Brabant NV of the Netherlands is a wholesale distributor of Dutch cheeses that it sells throughout the European Community. Unfortunately, the company's profits have been declining, which has caused considerable concern. To help understand the condition of the company, the managing director of the company has requested that the monthly income statement be segmented by sales territory. Accordingly, the company's accounting department has prepared the following statement for March, the most recent month. (The Dutch currency is the euro which is designated by €.)

	Sales Territory		
	Southern Europe	Middle Europe	Northern Europe
Sales	€300,000	€800,000	€ 700,000
Territorial expenses (traceable):			
Cost of goods sold	93,000	240,000	315,000
Salaries	54,000	56,000	112,000
Insurance	9,000	16,000	14,000
Advertising	105,000	240,000	245,000
Depreciation	21,000	32,000	28,000
Shipping	15,000	32,000	42,000
Total territorial expenses	297,000	616,000	756,000
Territorial income (loss) before corporate expenses	3,000	184,000	(56,000)
Corporate expenses:			
Advertising (general)	15,000	40,000	35,000
General administrative	20,000	20,000	20,000
Total corporate expenses	35,000	60,000	55,000
Net operating income (loss)	€ (32,000)	€124,000	€(111,000)

Cost of goods sold and shipping expenses are both variable; other costs are all fixed. Brabant NV purchases cheeses at auction and from farmers' cooperatives, and it distributes them in the three territories listed above. Each of the three sales territories has its own manager and sales staff. The cheeses vary widely in profitability; some have a high margin and some have a low margin. (Certain cheeses, after having been aged for long periods, are the most expensive and carry the highest margins.)

Required:

1. List any disadvantages or weaknesses that you see to the statement format illustrated above.
2. Explain the basis that is apparently being used to allocate the corporate expenses to the territories. Do you agree with these allocations? Explain.
3. Prepare a new segmented contribution format income statement for March. Show a Total column as well as data for each territory. In addition, for the company as a whole and for each sales territory, show each item on the segmented income statement as a percent of sales.
4. Analyze the statement that you prepared in (3) above. What points that might help to improve the company's performance would you bring to management's attention?