Chapter 1
Managerial Accounting and Cost Concepts

Questions

1-1 The three major types of product costs in a manufacturing company are direct materials, direct labor, and manufacturing overhead.

1-2

a. Direct materials are an integral part of a finished product and their costs can be conveniently traced to it.

b. Indirect materials are generally small items of material such as glue and nails. They may be an integral part of a finished product but their costs can be traced to the product only at great cost or inconvenience.

c. Direct labor consists of labor costs that can be easily traced to particular products. Direct labor is also called "touch labor."

d. Indirect labor consists of the labor costs of janitors, supervisors, materials handlers, and other factory workers that cannot be conveniently traced to particular products. These labor costs are incurred to support production, but the workers involved do not directly work on the product.

e. Manufacturing overhead includes all manufacturing costs except direct materials and direct labor. Consequently, manufacturing overhead includes indirect materials and indirect labor as well as other manufacturing costs.

1-3 A product cost is any cost involved in purchasing or manufacturing goods. In the case of manufactured goods, these costs consist of direct materials, direct labor, and manufacturing overhead. A period cost is a cost that is taken directly to the income statement as an expense in the period in which it is incurred.

1-4

a. Variable cost: The variable cost per unit is constant, but total variable cost changes in direct proportion to changes in volume.
b. Fixed cost: The total fixed cost is constant within the relevant range. The *average* fixed cost per unit varies inversely with changes in volume.
c. Mixed cost: A mixed cost contains both variable and fixed cost elements.

1-5

a. Unit fixed costs decrease as the activity level increases.
b. Unit variable costs remain constant as the activity level increases.
c. Total fixed costs remain constant as the activity level increases.
d. Total variable costs increase as the activity level increases.

1-6

a. Cost behavior: Cost behavior refers to the way in which costs change in response to changes in a measure of activity such as sales volume, production volume, or orders processed.
b. Relevant range: The relevant range is the range of activity within which assumptions about variable and fixed cost behavior are valid.

1-7 An activity base is a measure of whatever causes the incurrence of a variable cost. Examples of activity bases include units produced, units sold, letters typed, beds in a hospital, meals served in a cafe, service calls made, etc.

1-8 The linear assumption is reasonably valid providing that the cost formula is used only within the relevant range.

1-9 A discretionary fixed cost has a fairly short planning horizon—usually a year. Such costs arise from annual decisions by management to spend on certain fixed cost items, such as advertising, research, and management development. A committed fixed cost has a long planning horizon—generally many years. Such costs relate to a company's investment in facilities, equipment, and basic organization. Once such costs have been incurred, they are "locked in" for many years.

1-10 Yes. As the anticipated level of activity changes, the level of fixed costs needed to support operations may also change. Most fixed costs are adjusted upward and downward in large steps, rather than being absolutely fixed at one level for all ranges of activity.

1-11 The traditional approach organizes costs by function, such as production, selling, and administration. Within a functional area, fixed and variable costs are intermingled. The contribution approach income statement organizes costs by behavior, first deducting variable expenses to obtain contribution margin, and then deducting fixed expenses to obtain net operating income.

1-12 The contribution margin is total sales revenue less total variable expenses.

1-13 A differential cost is a cost that differs between alternatives in a decision. An opportunity cost is the potential benefit that is given up when one alternative is selected over another. A sunk cost is a cost that has already been incurred and cannot be altered by any decision taken now or in the future.

1-14 No, differential costs can be either variable or fixed. For example, the alternatives might consist of purchasing one machine rather than another to make a product. The difference between the fixed costs of purchasing the two machines is a differential cost.

The Foundational 15

1. Direct materials	$ 6.00	
Direct labor	3.50	
Variable manufacturing overhead	1.50	
Variable manufacturing cost per unit	$11.00	
Variable manufacturing cost per unit (a)	$11.00	
Number of units produced (b)	10,000	
Total variable manufacturing cost (a) × (b)		$110,000
Average fixed manufacturing overhead per unit (c)	$4.00	
Number of units produced (d)	10,000	
Total fixed manufacturing cost (c) × (d)		40,000
Total product (manufacturing) cost		$150,000

Note: The average fixed manufacturing overhead cost per unit of $4.00 is valid for only one level of activity—10,000 units produced.

2. Sales commissions	$1.00	
Variable administrative expense	0.50	
Variable selling and administrative per unit	$1.50	
Variable selling and admin. per unit (a)	$1.50	
Number of units sold (b)	10,000	
Total variable selling and admin. expense (a) × (b)		$15,000
Average fixed selling and administrative expense per unit ($3 fixed selling + $2 fixed admin.) (c)	$5.00	
Number of units sold (d)	10,000	
Total fixed selling and administrative expense (c) × (d)		50,000
Total period (nonmanufacturing) cost		$65,000

Note: The average fixed selling and administrative expense per unit of $5.00 is valid for only one level of activity—10,000 units sold.

The Foundational 15 (continued)

3.	Direct materials	$ 6.00
	Direct labor	3.50
	Variable manufacturing overhead	1.50
	Sales commissions	1.00
	Variable administrative expense	0.50
	Variable cost per unit sold	$12.50
4.	Direct materials	$ 6.00
	Direct labor	3.50
	Variable manufacturing overhead	1.50
	Sales commissions	1.00
	Variable administrative expense	0.50
	Variable cost per unit sold	$12.50
5.	Variable cost per unit sold (a)	$12.50
	Number of units sold (b)	8,000
	Total variable costs (a) × (b)	$100,000
6.	Variable cost per unit sold (a)	$12.50
	Number of units sold (b)	12,500
	Total variable costs (a) × (b)	$156,250
7.	Total fixed manufacturing cost (see requirement 1) (a)	$40,000
	Number of units produced (b)	8,000
	Average fixed manufacturing cost per unit produced (a) ÷ (b)	$5.00
8.	Total fixed manufacturing cost (see requirement 1) (a)	$40,000
	Number of units produced (b)	12,500
	Average fixed manufacturing cost per unit produced (a) ÷ (b)	$3.20
9.	Total fixed manufacturing cost (see requirement 1)	$40,000

The Foundational 15 (continued)

10. Total fixed manufacturing cost (see requirement 1).....	$40,000	
11. Variable overhead per unit (a)	$1.50	
Number of units produced (b).....	8,000	
Total variable overhead cost (a) × (b)		$12,000
Total fixed overhead (see requirement 1).....		40,000
Total manufacturing overhead cost.....		$52,000
Total manufacturing overhead cost (a).....		$52,000
Number of units produced (b).....		8,000
Manufacturing overhead per unit (a) ÷ (b)...		$6.50
12. Variable overhead per unit (a)	$1.50	
Number of units produced (b).....	12,500	
Total variable overhead cost (a) × (b)		$18,750
Total fixed overhead (see requirement 1).....		40,000
Total manufacturing overhead cost.....		$58,750
Total manufacturing overhead cost (a).....		$58,750
Number of units produced (b).....		12,500
Manufacturing overhead per unit (a) ÷ (b)...		$4.70
13. Selling price per unit	$22.00	
Variable cost per unit sold (see requirement 4).....	12.50	
Contribution margin per unit.....	$ 9.50	

The Foundational 15 (continued)

14. Direct materials per unit	$6.00	
Direct labor per unit	3.50	
Direct manufacturing cost per unit	$9.50	
Direct manufacturing cost per unit (a)	$9.50	
Number of units produced (b)	11,000	
Total direct manufacturing cost (a) × (b)	$104,500	
Variable overhead per unit (a)	$1.50	
Number of units produced (b)	11,000	
Total variable overhead cost (a) × (b)		$16,500
Total fixed overhead (see requirement 1)		40,000
Total indirect manufacturing cost		$56,500

15. Direct materials per unit	$6.00	
Direct labor per unit	3.50	
Variable manufacturing overhead per unit	1.50	
Incremental cost per unit produced	$11.00	

Note: Variable selling and administrative expenses are variable with respect to the number of units sold, not the number of units produced.

Problem 1-18 (10 minutes)

1. The direct costs of the Apparel Department are as follows:

Apparel Department cost of sales—Evendale Store	$ 90,000
Apparel Department sales commission—Evendale Store	7,000
Apparel Department manager's salary—Evendale Store	8,000
Total direct costs for the Apparel Department	$105,000

2. The direct costs of the Evendale Store are as follows:

Apparel Department cost of sales—Evendale Store	$ 90,000
Store manager's salary—Evendale Store	12,000
Apparel Department sales commission—Evendale Store	7,000
Store utilities—Evendale Store	11,000
Apparel Department manager's salary—Evendale Store	8,000
Janitorial costs—Evendale Store	9,000
Total direct costs for the Evendale Store	$137,000

3. The direct costs in the Apparel Department that are also variable with respect to departmental sales is computed as follows:

Apparel Department cost of sales—Evendale Store	$90,000
Apparel Department sales commission—Evendale Store	7,000
Total direct costs for the Apparel Department that are also variable costs	$97,000

Problem 1-19 (30 minutes)

1. Contribution format income statement

Todrick Company
Contribution Format Income Statement

Sales		$300,000
Variable expenses:		
Cost of goods sold ($20,000 + $200,000 – $7,000)	$213,000	
Selling expense	15,000	
Administrative expense	12,000	240,000
Contribution margin		60,000
Fixed expenses:		
Selling expense	30,000	
Administrative expense	12,000	42,000
Net operating income		$ 18,000

The variable administrative expense shown above ($12,000) is computed as follows:

Sales (a)	$300,000	
Contribution margin (b)	$60,000	
Total variable costs (a) – (b)		$240,000
Total variable costs (a)		$240,000
Cost of goods sold	$213,000	
Variable selling expense	15,000	
Cost of goods sold plus variable selling expense (b)		$228,000
Variable administrative expense (a) – (b)		$12,000

Problem 1-19 (continued)

The fixed selling expense shown above ($30,000) is computed as follows:

Contribution margin (a)	$60,000	
Net operating income (b)	$18,000	
Total fixed costs (a) – (b)		$42,000
Total fixed costs (a)		$42,000
Fixed administrative expense (b)		$12,000
Fixed selling expense (a) – (b)		$30,000

2. Traditional income statement

Todrick Company
Traditional Income Statement

Sales		$300,000
Cost of goods sold ($20,000 + $200,000 – $7,000)		213,000
Gross margin		87,000
Selling and administrative expenses:		
Selling expense ($15,000 + $30,000)	$45,000	
Administrative expense ($12,000 + $12,000)	24,000	69,000
Net operating income		$ 18,000

3. The selling price per unit is $300,000 ÷ 1,000 units sold = $300.

4. The variable cost per unit is $240,000 ÷ 1,000 units sold = $240.

5. The contribution margin per unit is $300 – $240 = $60.

6. The contribution format is more useful because it organizes costs based on their cost behavior. The contribution format enables managers to quickly calculate how variable costs will change in response to changes in unit sales.

Problem 1-21 (45 minutes)

1.

Marwick's Pianos, Inc.
Traditional Income Statement
For the Month of August

Sales (40 pianos × $3,125 per piano)		$125,000
Cost of goods sold (40 pianos × $2,450 per piano)		98,000
Gross margin		27,000
Selling and administrative expenses:		
Selling expenses:		
Advertising	$ 700	
Sales salaries and commissions [$950 + (8% × $125,000)]	10,950	
Delivery of pianos (40 pianos × $30 per piano)	1,200	
Utilities	350	
Depreciation of sales facilities	800	
Total selling expenses	14,000	
Administrative expenses:		
Executive salaries	2,500	
Insurance	400	
Clerical [$1,000 + (40 pianos × $20 per piano)]	1,800	
Depreciation of office equipment	300	
Total administrative expenses	5,000	
Total selling and administrative expenses		19,000
Net operating income		$ 8,000

Problem 1-21 (continued)

2.

Marwick's Pianos, Inc.
Contribution Format Income Statement
For the Month of August

	Total	*Per Piano*
Sales (40 pianos × $3,125 per piano)	$125,000	$3,125
Variable expenses:		
Cost of goods sold (40 pianos × $2,450 per piano)	98,000	2,450
Sales commissions (8% × $125,000)	10,000	250
Delivery of pianos (40 pianos × $30 per piano)	1,200	30
Clerical (40 pianos × $20 per piano)	800	20
Total variable expenses	110,000	2,750
Contribution margin	15,000	$ 375
Fixed expenses:		
Advertising	700	
Sales salaries	950	
Utilities	350	
Depreciation of sales facilities	800	
Executive salaries	2,500	
Insurance	400	
Clerical	1,000	
Depreciation of office equipment	300	
Total fixed expenses	7,000	
Net operating income	$ 8,000	

3. Fixed costs remain constant in total but vary on a per unit basis inversely with changes in the activity level. As the activity level increases, for example, the fixed costs will decrease on a per unit basis. Showing fixed costs on a per unit basis on the income statement might mislead management into thinking that the fixed costs behave in the same way as the variable costs. That is, management might be misled into thinking that the per unit fixed costs would be the same regardless of how many pianos were sold during the month. For this reason, fixed costs generally are shown only in totals on a contribution format income statement.

Problem 1-22 (45 minutes)

1. The total manufacturing overhead cost is computed as follows:

Direct labor cost (a)	$15,000
Direct labor as a percentage of total conversion costs (b)	30%
Total conversion cost (a) ÷ (b)	$50,000

Total conversion cost (a)	$50,000
Direct labor cost (b)	$15,000
Total manufacturing overhead cost (a) – (b)	$35,000

2. The total direct materials cost is computed as follows:

Direct labor cost (a)	$15,000
Direct labor as a percentage of total prime costs (b)	40%
Total prime cost (a) ÷ (b)	$37,500

Total prime cost (a)	$37,500
Direct labor cost (b)	$15,000
Total direct materials cost (a) – (b)	$22,500

3. The total amount of manufacturing cost is computed as follows:

Direct materials cost	$22,500
Direct labor cost	15,000
Manufacturing overhead cost	35,000
Total manufacturing cost	$72,500

4. The total variable selling and administrative cost is computed as follows:

Total sales (a)	$120,000
Sales commission percentage (b)	5%
Total variable selling and administrative cost (a) × (b)	$6,000

5. The total variable cost is computed as follows:

Direct materials cost	$22,500
Direct labor cost	15,000
Sales commissions	6,000
Total variable cost	$43,500

6. The total fixed cost is computed as follows:

Total selling and administrative expenses (a)	$18,000	
Sales commissions (b)	$6,000	
Total fixed selling and administrative expense (a) – (b)		$12,000
Total fixed manufacturing overhead		35,000
Total fixed cost		$47,000

7. The total contribution margin is calculated as follows:

Sales (a)	$120,000
Variable costs (b)	$43,500
Contribution margin (a) – (b)	$76,500