

Managerial Accounting - Book Notes

Chapter 01 – Managerial Accounting basics

Managers' activities and responsibilities can be classified into three broad functions:

1. **Planning**
2. **Directing**
3. **Controlling**

Organizational charts: show the interrelationships of activities and the delegation of authority and responsibility within the company

Ethics: The **IMA's Statement of Ethical Professional Practice** provides the following codes of conduct regarding competence, confidentiality, integrity, and credibility

Managerial accounting practices

- The **value chain** refers to all activities associated with providing a product or service
 - 1) Research and development, and product design
 - 2) The acquisition of raw materials,
 - 3) Production
 - 4) Sales and marketing
 - 5) Delivery
 - 6) Customer relations, and subsequent service
- Technology:
 - Many companies now employ **enterprise resource planning (ERP)** software systems to manage their value chains; ERP systems provide a comprehensive, centralized, and integrated source of information.
 - **Computer-integrated manufacturing (CIM):** using CIM, many companies can now manufacture products that are untouched by human hands
- **Just-in-time (JIT) inventory methods**
- **Total quality management (TQM)** systems to reduce defects (Bottlenecks: constraints that limit the company's potential profitability) in finished products
- **Activity-based costing (ABC):** overhead is allocated based on each product's use of economic resources as it undergoes various activities
- **Theory of constraints** is a specific approach used to identify and manage constraints in order to achieve the company's goals
- **Lean manufacturing:** sets out to eliminate waste and to concentrate more accurately on the needs of the customer
- **Balanced scorecard:** performance-measurement approach that uses both financial and non-financial measures to evaluate all aspects of a company's operations in an integrated way

Chapter 02 - Managerial cost concepts and cost behaviour analysis

Manufacturing costs consists of activities and processes that convert raw materials into finished goods

Direct material

- **Raw materials** are the basic materials and parts used in the manufacturing process
- **Direct materials** are raw materials that can be physically and directly associated with the finished product (flour for bread, steel for automobiles)
- **Indirect materials** (1) do not physically become part of the finished product (lubricants and polishing compounds) or (2) cannot be easily traced because their physical association with the finished product is too small in terms of cost (sandpaper and glue)
Indirect materials are accounted for in the manufacturing overhead
- **Direct labour** is the work of factory employees that can be physically and directly associated with converting raw materials into finished goods
- **Indirect labour** (1) is the work of factory employees that has no physical association with the finished product, or (2) is work for which it is impractical to trace costs to the goods produced. (Wages of maintenance people, timekeepers, and supervisors)

Manufacturing overhead is the costs that are indirectly associated with the manufacture of the finished product

→ It contains: indirect materials, indirect labour, depreciation on factory buildings and machines, and insurance, taxes, and maintenance on factory facilities

Prime costs vs. conversion costs

- **Prime costs** are the sum of all direct materials costs and direct labour costs
- **Conversion costs** are the sum of all direct labour costs and manufacturing overhead costs, which together are the costs of converting raw materials into a final product

Product costs vs. period costs

- **Product costs** are costs that are a necessary and integral part of producing the finished product (recorded when incurred as inventory and when sold as cost of good sold)
- **Period costs** are costs that are matched with the revenue of a specific time period (deducted from revenues) e.g. administrative and selling expenses

Cost behaviour analysis

- **Variable costs:** vary in total directly and proportionally with changes in the activity level (remains the same per unit at every level of activity)
- **Fixed costs:** remain the same in total within the relevant range regardless of changes in the activity level
- **Mixed costs** (or semi variable costs) have both a variable element and a fixed element
- The **high-low method** uses the total costs incurred at the high and low levels of activity
$$\text{Change in total costs} / \text{change in activity levels} = \text{variable cost per unit}$$

Manufacturing Costs in financial statements

Income Statement

Beginning finished goods inventory
+ Cost of goods manufactured
- Ending goods inventory
= Cost of goods sold

Beginning work in process inventory
+ Total manufacturing cost
= Total cost of work in process
- Ending work in process inventory
= Cost of goods manufactured

Balance sheet

Have three inventories:

- Raw material inventory
- Work in process inventory
- Finished goods inventory

Chapter 03 – Job-order cost accounting

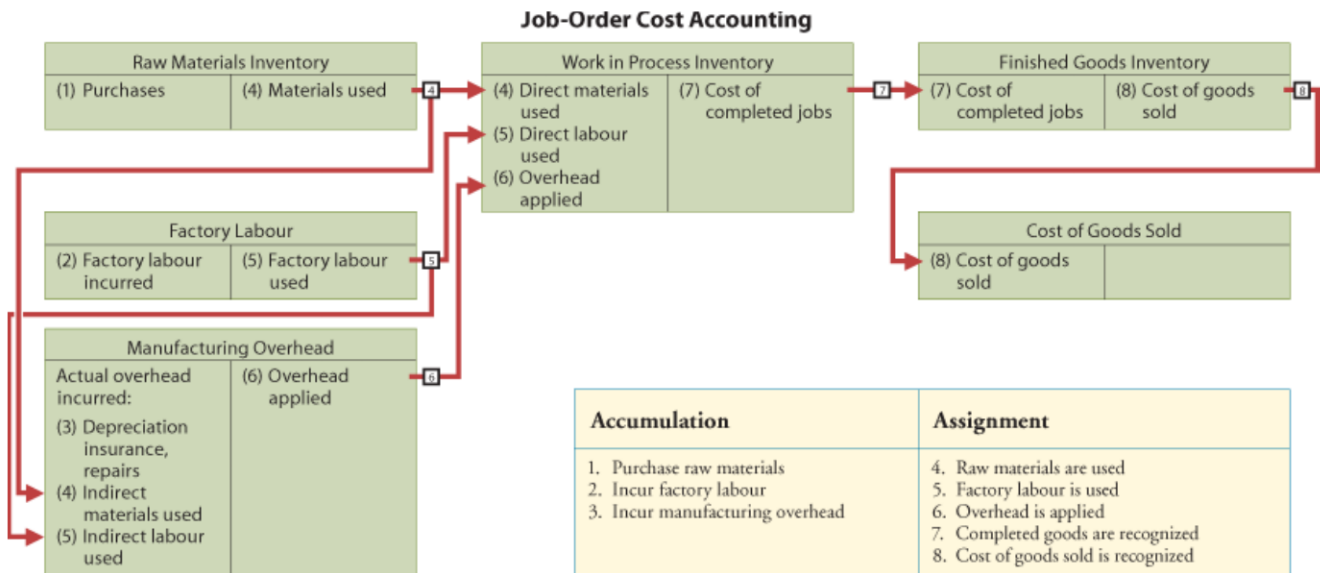
Cost accounting involves the measuring, recording, and reporting of product costs (total cost and unit cost). A **cost accounting system** consists of accounts for the various manufacturing costs (it uses the perpetual inventory system)

The two basic types of cost accounting systems are:

1. Job-order cost system: the company assigns costs to each job or to each batch of goods. Each job (or batch) has its own unique characteristics.
2. Process cost system: the company manufactures a large volume of similar products and accumulates product-related costs for a period of time (week, month). The costs are assigned to departments or processes for a set (predetermined) period of time

Job-Order Cost Flow

Manufacturing costs → work in process inv. → finished goods inv. → cost of goods sold



The cost flows in the diagram can be categorized as one of four types:

- **Accumulation:** The company first accumulates costs by (1) purchasing raw materials, (2) incurring labour costs, and (3) incurring manufacturing overhead costs.
- **Assignment to Jobs:** Once the company has incurred manufacturing costs, it must assign them to specific jobs:
 1. As it uses raw materials on specific jobs (4), it assigns them to work in process, or treats them as manufacturing overhead if the raw materials cannot be associated with a specific job.
 2. It either assigns factory labour (5) to work in process, or treats it as manufacturing overhead if the factory labour cannot be associated with a specific job.
 3. It assigns manufacturing overhead (6) to work in process using a

predetermined overhead rate

- o Predetermined overhead rate= estimated annual overhead costs / expected annual operating activity
- o "Actual activity based used x predetermined overhead rate" is assigned to work in process

•**Completed Jobs:** As jobs are completed (7), the company transfers the cost of the completed job out of work in process inventory into finished goods inventory.

•**When Goods Are Sold:** As specific items are sold (8), the company transfers their cost out of finished goods inventory into cost of goods sold.

Under-Applied or Over-Applied Manufacturing Overhead

- **Under-applied overhead:** means that the overhead assigned to Work in Process is less than the overhead incurred (manufacturing overhead has a debit balance)
- **Over-applied overhead:** means that the overhead assigned to Work in Process is greater than the overhead incurred (manufacturing overhead has a debit balance)

Dec. 31	Manufacturing Overhead	2,500	
	Cost of Goods Sold		2,500
	To close over-applied Manufacturing Overhead (i.e., to transfer over-applied overhead to cost of goods sold).		

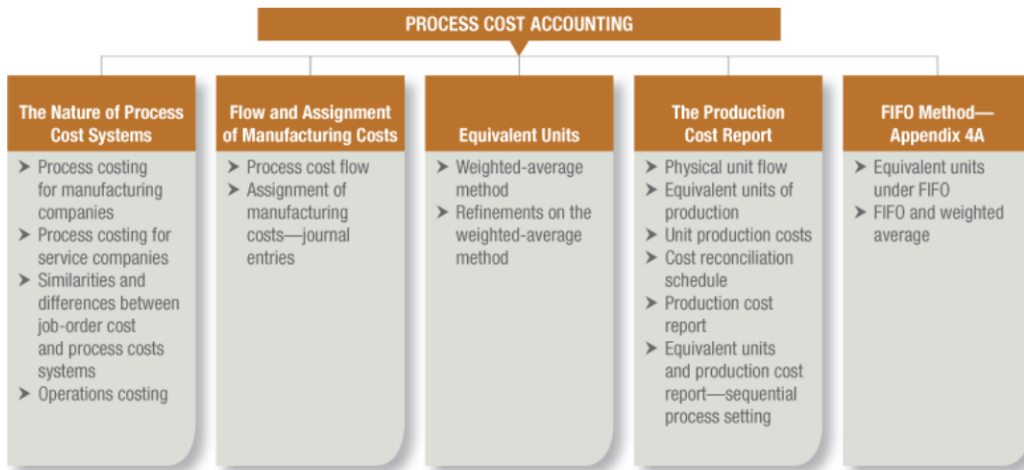
The end-of-period under-applied or over-applied overhead costs are treated in one of two methods

- 1) Make an **adjustment to Cost of Goods Sold**
- 2) **Proration method:**
 - o Determine the ratio of each account's balance to the total of the three account balances together
 - o Apply this ratio to the under- or over-applied overhead amount

Dec. 31	Work in Process Inventory (\$10,000 ÷ \$100,000) × \$10,000	1,000	
	Finished Goods Inventory (\$20,000 ÷ \$100,000) × \$10,000	2,000	
	Cost of Goods Sold (\$70,000 ÷ \$100,000) × \$10,000	7,000	
	Manufacturing Overhead		10,000
	To close under-applied Manufacturing Overhead.		

Chapter 04 – Process Cost Systems

- ⇒ Companies use process cost systems to apply costs to similar products that are mass-produced in a continuous way
- ⇒ In a job-order cost system, costs are assigned to each job. In a process cost system, costs are tracked through a series of departments, rather than by individual jobs



Similarities and differences between job-order and cost process

Similarities

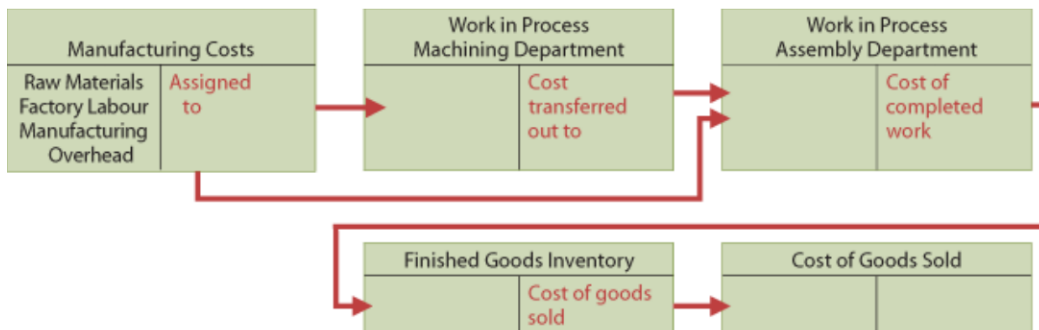
1. The manufacturing cost elements (direct materials, direct labour, and manufacturing overhead)
2. The accumulation of the costs of materials, labour, and overhead
3. The flow of costs

Differences

1. The number of work in process accounts used
2. Documents used to track costs (job cost sheet vs. production cost report for each department).
3. The point at which costs are totalled (when the job is completed vs. at the end of the period)
4. Unit cost calculations (total cost per job divided by the units produced vs. total manufacturing cost for the period divided by the units produced during the period)

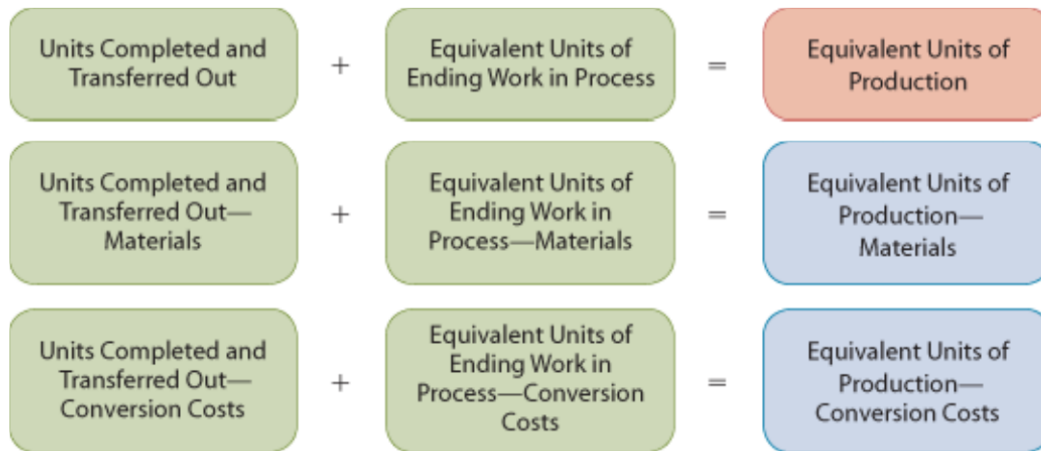
⇒ **Operations costing or hybrid cost systems:** combination of a process cost and a job-order cost system

The process cost flow



Equivalent Units of production measure the work done during the period, expressed in fully completed units (\neq physical units of production)

Weighted-average method: considers the degree of completion (weighting) of the units completed and transferred out and the ending work in process



- ⇒ **Conversion costs:** sum of labour costs and overhead costs
- ⇒ In calculating equivalent units, the beginning work in process is not part of the equivalent units of production formula

The production cost report: document for management that shows the production quantity and cost data for a production department

To be ready to complete a production cost report, the company must perform four steps:

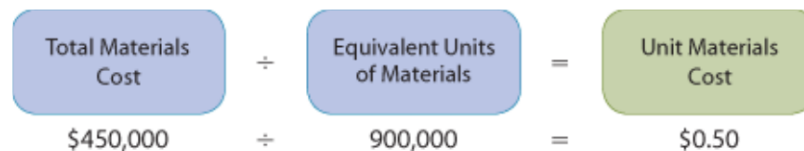
Step 1 - Calculate the physical unit flow

- ⇒ Physical units: actual units to be accounted for during a period, regardless of any work performed
- ⇒ Total units to be accounted for: units started (or transferred) into production during the period and the units in process at the beginning of the period
- ⇒ Total units accounted for: units transferred out during the period and any units in process at the end of the period

Step 2 - Calculate the equivalent units of production

Step 3 - Calculate the unit production costs

- ⇒ Unit production costs: costs expressed in terms of equivalent units of production



<div style="border: 1px solid black; border-radius: 10px; background-color: #f4a460; padding: 5px; width: fit-content; margin: 0 auto;">Total Conversion Cost</div>	÷	<div style="border: 1px solid black; border-radius: 10px; background-color: #f4a460; padding: 5px; width: fit-content; margin: 0 auto;">Equivalent Units of Conversion Costs</div>	=	<div style="border: 1px solid black; border-radius: 10px; background-color: #9b9bc4; padding: 5px; width: fit-content; margin: 0 auto;">Unit Conversion Cost</div>										
\$205,000		820,000		\$0.25										
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 5px;"> <div style="border: 1px solid black; border-radius: 10px; background-color: #a4c49b; padding: 5px; width: fit-content; margin: 0 auto;">Unit Materials Cost</div> </td> <td style="text-align: center; padding: 0 10px;">+</td> <td style="text-align: center; padding: 5px;"> <div style="border: 1px solid black; border-radius: 10px; background-color: #9b9bc4; padding: 5px; width: fit-content; margin: 0 auto;">Unit Conversion Cost</div> </td> <td style="text-align: center; padding: 0 10px;">=</td> <td style="text-align: center; padding: 5px;"> <div style="border: 1px solid black; border-radius: 10px; background-color: #9bc4e4; padding: 5px; width: fit-content; margin: 0 auto;">Total Manufacturing Cost per Unit</div> </td> </tr> <tr> <td style="text-align: center;">\$0.50</td> <td></td> <td style="text-align: center;">\$0.25</td> <td></td> <td style="text-align: center;">\$0.75</td> </tr> </table>					<div style="border: 1px solid black; border-radius: 10px; background-color: #a4c49b; padding: 5px; width: fit-content; margin: 0 auto;">Unit Materials Cost</div>	+	<div style="border: 1px solid black; border-radius: 10px; background-color: #9b9bc4; padding: 5px; width: fit-content; margin: 0 auto;">Unit Conversion Cost</div>	=	<div style="border: 1px solid black; border-radius: 10px; background-color: #9bc4e4; padding: 5px; width: fit-content; margin: 0 auto;">Total Manufacturing Cost per Unit</div>	\$0.50		\$0.25		\$0.75
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\$0.50		\$0.25		\$0.75										

Step 4 - Prepare a cost reconciliation schedule.

Example of a CRS ([see next page](#))

Sequential process setting: goods are transferred from one department to another in a sequence

Equivalent units under FIFO

- ⇒ Under the FIFO method, the calculation of equivalent units is done on a first-in, first-out basis
- ⇒ Using the FIFO method, equivalent units are the sum of the following work:
 - 1) Work done to finish the units from the beginning work in process inventory.
 - 2) Work done to complete the units started into production during the period (referred to as the units started and completed).
 - 3) Work done to start, but only partially complete, the units in ending work in process inventory.

MIXING DEPARTMENT
Production Cost Report
Month Ended June 30, 2012

	Physical Units	Equivalent Units		
		Materials	Conversion Costs	
Quantities	Step 1	Step 2		
Units to be accounted for				
Work in process, June 1	100,000			
Started into production	<u>800,000</u>			
Total units	<u>900,000</u>			
Units accounted for				
Transferred out	700,000	700,000	700,000	
Work in process, June 30	<u>200,000</u>	<u>200,000</u>	<u>120,000</u>	(200,000 × 60%)
Total units	<u>900,000</u>	<u>900,000</u>	<u>820,000</u>	
Costs		Materials Costs	Conversion	Total
Unit costs Step 3				
Costs in June	(a)	\$450,000	\$205,000	\$655,000
Equivalent units	(b)	<u>900,000</u>	<u>820,000</u>	
Unit costs [(a) ÷ (b)]		\$ 0.50	\$ 0.25	\$ 0.75
Costs to be accounted for				
Work in process, June 1				\$ 85,000
Started into production				<u>570,000</u>
Total costs				<u>\$655,000</u>
Cost Reconciliation Schedule Step 4				
Costs accounted for				
Transferred out (700,000 × \$0.75)				\$525,000
Work in process, June 30				
Materials (200,000 × \$0.50)			\$100,000	
Conversion costs (120,000 × \$0.25)			<u>30,000</u>	<u>130,000</u>
Total costs				<u>\$655,000</u>

Chapter 05 – Activity-based costing

Activity-based costing (ABC) allocates overhead to multiple activity cost pools, and it then assigns the activity cost pools to products and services by using cost drivers

- ⇒ Activity is any event, action, transaction, or work sequence that incurs a cost when producing a product or providing a service
- ⇒ Activity cost pool is a distinct type of activity (e.g., ordering materials or setting up machines)
- ⇒ Cost driver is any factor or activity that has a direct cause-effect relationship with the resources consumed

ABC principle: products consume activities, and activities consume resources

ABC process:

- 1) Allocate overhead costs to activity cost pools
- 2) Use cost drivers to assign the overhead allocated to the activity cost pools to specific products

Steps in an activity-based costing system

- 1) Identify and classify the major **activities** involved in the manufacture of specific products, and allocate manufacturing overhead costs to cost pools
- 2) Identify the **cost driver** that has a strong correlation to the costs accumulated in the cost pool
- 3) Calculate the **overhead rate for each cost driver**

$$\begin{array}{c} \text{Estimated Overhead} \\ \text{per Activity} \end{array} \div \begin{array}{c} \text{Expected Use of Cost} \\ \text{Drivers per Activity} \end{array} = \begin{array}{c} \text{Activity-Based} \\ \text{Overhead Rate} \end{array}$$

- 4) Assign **manufacturing overhead costs** for each cost pool to products, using the overhead rates (cost per driver).

Benefit and limitation of ABC

Benefits: more accurate product costing

1. ABC leads to more cost pools for assigning overhead costs to products
2. ABC leads to better control over overhead costs
3. ABC leads to better management decisions

Limitations

1. ABC can be expensive to use
2. Some arbitrary allocations continue to be used

When to use ABC

- 1) Product lines differ greatly in volume and manufacturing complexity.
- 2) Product lines are numerous and diverse, and require differing degrees of support services.
- 3) Overhead costs are a significant portion of total costs.
- 4) The manufacturing process or the number of products has changed significantly; for example, from labour-intensive to capital-intensive due to automation.

- 5) Production or marketing managers are ignoring data provided by the existing system and are instead using “bootleg” costing data or other alternative data when pricing or making other product decisions.
- 6) The scale of the business is large enough to support the high upfront cost of the system software and ongoing support costs.

Value-added and non-value-added

- ⇒ **Activity-based management (ABM)**: An extension of ABC from a product costing system to a management function that focuses on reducing costs and improving processes and decision-making.
- ⇒ **Value-added activities** increase the worth of a product or service to customers
- ⇒ **Non-value-added activities** are production- or service-related activities that simply add cost to, or increase the time spent on, a product or service without increasing its market value

Classification of activity levels

- 7) **Unit-level activities**—activities performed for each unit of production.
- 1) **Batch-level activities**—activities performed for each batch of products rather than each unit.
- 2) **Product-level activities**—activities performed in support of an entire product line, but not always performed every time a new unit or batch of products is produced.
- 3) **Facility-level activities**—activities required to support or sustain an entire production process.

Chapter 6 – Cost-volume-profit

I. Cost-Volume-Profit Analysis and Income Statement

Cost-volume-profit (CVP) analysis is the study of the effects that changes in costs and volume have on a company's profits

→ The following assumptions underlie each CVP analysis:

- 1) The behaviour of both costs and revenues is linear throughout the relevant range of the activity index.
- 2) All costs can be classified with reasonable accuracy as either variable or fixed.
- 3) Changes in activity are the only factors that affect costs.
- 4) Inventory levels remain constant—all units that are produced are sold.
- 5) When more than one type of product is sold, the sales mix will remain constant.

The **cost-volume-profit (CVP) income statement** classifies costs as variable or fixed and calculates a contribution margin

II. Contribution margin (CM) is the amount of revenue that remains after variable costs have been deducted

$$\begin{array}{r}
 \text{Sales} \\
 - \text{Variable costs} \\
 = \text{Contribution margin} \\
 - \text{Fixed costs} \\
 = \text{Operating income}
 \end{array}$$

Unit Selling Price	–	Unit Variable Costs	=	Contribution Margin per Unit
\$500	–	\$300	=	\$200
Contribution Margin per Unit	÷	Unit Selling Price	=	Contribution Margin Ratio
\$200	÷	\$500	=	40%

III. Applying Basic Cost-Volume-Profit Concepts

Break even analysis

→ **The break-even point:** level of activity at which total revenues equal total costs (both fixed and variable)

→ The break-even point can be

- 1) *calculated with a mathematical equation,*

$$\text{Sales} = \text{variable costs} + \text{fixed costs} + \text{operating income}$$

Operating income is zero at the break-even point, break-even occurs when total sales equal variable costs plus fixed costs:

Sales	=	Variable Costs	+	Fixed Costs	+	Operating income
\$500Q	=	\$300Q	+	\$200,000	+	\$0

To find the sales dollars required to break even, we multiply the units sold at the break-even point by the selling price per unit

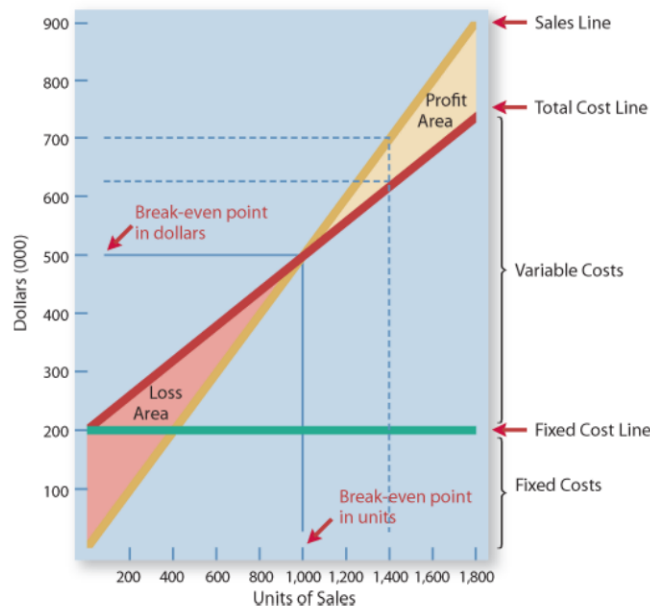
2) *Calculated by using contribution margin*

the contribution margin equals total revenues less variable costs, so at the break-even point, the **contribution margin must equal total fixed costs**

Fixed Costs	÷	Contribution Margin per Unit	=	Break-Even Point in Units
\$200,000		\$200		1,000 units
Fixed Costs	÷	Contribution Margin Ratio	=	Break-Even Point in Dollars
\$200,000		40%		\$500,000

3) *Derived from a cost-volume-profit (CVP) graph*

The **cost-volume-profit (CVP) graph**: graph showing the relationship between costs, volume, and profits



IV. Target operating income before and after tax

Target operating income: income objective for individual product lines

→ Technique for determining the sales necessary to achieve the target operating:

1) *The mathematical equation*

Variable Costs	+	Fixed Costs	+	Target Operating income	=	Required Sales
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2) *The contribution margin technique*

Fixed Costs + Target Operating income before Taxes	÷	Contribution Margin per Unit	=	Required Sales in Units
Fixed Costs + Target Operating Income before Taxes	÷	Contribution Margin Ratio	=	Required Sales in Dollars

3) *The graphic representation*

Operating income after taxes = operating income before taxes x (1 - tax rate)

V. Margin of safety

Margin of safety is the difference between actual or expected sales and sales at the break-even point (expressed in dollars, units or as a ratio)

Actual (Expected) Sales	-	Break-Even Sales	=	Margin of Safety in Dollars
\$750,000	-	\$500,000	=	\$250,000
Margin of Safety in Dollars	÷	Actual (Expected) Sales	=	Margin of Safety Ratio
\$250,000	÷	\$750,000	=	33%

VI. CVP and changes in the business environment

CVP can help measure the affect of changes in fixed costs, variable costs, and selling price on the number of required sale to break even

VII. Sales mix: when a company sells multiple products

Companies must measure the **weighted-average unit contribution margin** of all the products

DVD Players		TVs		
Unit Contribution Margin	×	Sales Mix Percentage	+	Unit Contribution Margin
(\$200 × 0.75)		(\$500 × 0.25)	=	Weighted-Average Unit Contribution Margin
				\$275
Fixed Costs	÷	Weighted-Average Unit Contribution Margin	=	Break-Even Point in Units
\$275,000	÷	\$275	=	1,000 units

→ At any level of units sold, operating income will be greater if higher contribution margin units are sold, rather than lower contribution margin units