ACC406

INTRODUCTORY MANAGEMENT ACCOUNTING

FINAL EXAM CRASH COURSE
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Easy Grade Tutorials

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Chapter 1 – Introduction to Managerial Accounting

What is managerial Accounting?

Managerial Accounting is accounting that is not governed by strict rules that is used to help managers do the following:

Plan	Control	Make Decisions
		

Difference between Managerial and Financial Accounting

	Financial Accounting	**Managerial Accounting**
Target User	External Users	Internal Users
Restriction	Must follow rules	Not restricted to any rules
Type of Info	Product objectives and written financial information	Includes historical events but focuses on future events
Degree of Aggregation	Overall firm performance	Performance of entities, product lines, departments and mangers
Breadth	Self-Contained	Multiple Disciplines: • Managerial Economics • Industrial Engineering • Management Science etc…
Time Orientation	Reports on historical events	Includes historical events but focuses on future events.

Ethical Conduct

Measured through 10 "Core Values"

1) Honesty	2) Integrity	3) Promises Keeping	4) Fidelity	5) Fairness
6) Caring for Others	7) Respect for Others	8) Responsible Citizenship	9) Pursuit of Excellence	10)Accountability

Chapter 1 – Review Questions

Question 1:
Are the following scenarios the responsibilities of Managerial or Financial accountants?

1. Ricardo Hermanos, the materials sourcer, is deciding whether he should purchase materials locally or from China
2. Jahan, the payroll clerk, is calculating the income tax disbursements the company must pay at month end
3. Franziska is the president of a small cellphone reseller, she is calculating her expected sales and costs to budget for the holiday season
4. Nazia is a managing a small painting project, she is deciding whether to hire a helper to finish the project sooner or to do the work herself

Answer 1:

Are the following scenarios the responsibilities of Managerial or Financial accountants?

1. Managerial Accounting, Ricardo is making business decisions
2. Financial Accounting.
3. Managerial Accounting, Franziska is planning
4. Managerial Accounting, Nazia is making business decisions

Chapter 2 – Introduction to Managerial Accounting

There are two types of firms, those that provide a **Service** and those that **Sell a Product**.
NOTE: We will be focusing on those that sell a product in this course

When it comes to products, three things are really important:

1) Price: What we charge the customer for the product
2) Cost: Amount of Cash or Cash Equivalent sacrificed for goods/services
3) Expense: The cost of an expired (or used up) asset

Assigning Costs to Costs Objectives

Sometimes one cost is used for two different purposes. As managerial accountants, we need to know this in order to plan, control and make decisions.

A **Cost Object** is anything that a can be the cause of a cost. They can be products, customers, regions, and departments.

> Example: if the sales department uses office supplies, then the office supplies expense will be assigned to the Sales Department. This means that at the end of the year we can look to see how many dollars of office supplies were used by the Sales Department, instead of the Finance Department.

How to Assign a Cost – Example

At the end of the month, you are told that $350 of office supplies has been consumed by both the Sales and Administrative departments. You are also told that a phone bill of $450 has been paid, again this has been consumed by both departments. If the Sales Department has used $100 of office supplies and $250 of the phone bill, calculate the assigned cost of these expenses to both the Sales and Administrative Departments.

Cost	Sales Department	Admin Department	Total
Office Supplies	$100	$250	$350
Phone Bill	$250	$200	$450
Total	$350	$450	$800

Classifying Costs

Costs can be grouped together in many different ways, 3 of these ways are:

1) Direct vs. Indirect
2) Variable vs. Fixed
3) Product vs. Non-Product (Period Costs)

1) Direct vs. Indirect

Direct Costs can be easily traced to a cost object. The impact of these costs can be physically seen. For example: the cost of the fabric used in making a T-Shirt is direct because I can physically see it in the product.

Indirect Costs cannot be easily traced to a cost object. These are things like the cost of the rent of the factory where a T-Shirt was made. It is very hard to see exactly how this cost impacts the product and these costs need to be assigned using allocation.

2) Variable vs. Fixed

Variable Costs increase or decrease depending on output. For example: the cost of the fabric used in making T-Shirts depends on the number of T-Shirts I make. If I make no T-Shirts, I will have no cost.

Fixed Costs are constant no matter how much is produced. For example: the cost of renting a manufacturing plan to make shirts is a contractual obligation that must be paid. Whether everyone is working hard to make T-Shirts or if they are all on vacation.

3) Product vs. Non-Product (Period Costs)

Product Costs are costs that have been used to make a product. They are also very specific and can be broken down into 3 groups:

- Direct Materials: the materials used in making the product
- Direct Labour: the labour that has made a direct, physical, tangible impact in making the product
- Manufacturing Overhead: all other costs to manufacture a product that are not Direct Material and Direct Labour. Examples: rent of the manufacturing plant, shipping expenses, cost of cleaning the manufacturing plant, utilities in the manufacturing plant, indirect material, indirect labour, etc.

Non-Product or Period Costs are everything else. These are all of the other costs that have been incurred in order for the business to function. Rather than being allocated to the product, they are allocated to the period in which they were used. Examples are salaries for finance, administrative, sales, and research & development staff, rent for the head office where no products are manufactured, advertising expenses, etc.

More about period costs:

Total Product Cost = Direct Materials + Direct Labour + Manufacturing OH

Prime Costs *Conversion Costs*

UNIT COST = Total Production Cost / #er of units produced

Income Statement for Manufacturing and Merchandising Firms:

Merchandising Business		Manufacturing Business	
Sales	$1,000,000	Sales	$1,000,000
Beginning **finished goods** inventory	$100,000	Beginning **Finished Goods** inventory	$100,000
Plus: **net purchases**	$800,000	Plus: **Costs of Goods Manufactured**	$800,000
Cost of finished goods available for sale	$900,000	Cost of finished goods available for sale	$900,000
Less: ending finished goods inventory	$150,000	Less ending finished goods inventory	$150,000
Cost of merchandise sold	$750,000	Cost of merchandise sold	$750,000
Gross profit	$250,000	Gross Profit	$250,000

In the reporting process for firs that sell products, they must report *Costs of Goods Sold*

Determining COGS:

1. Calculate Direct Materials Used

Beginning Direct Materials Inventory
+ Purchases of Direct Materials
- Ending Direct Materials Inventory .
= Direct Materials Used in Production

2. Calculate Total Production Costs

Direct Materials Used in Production
+ Direct Labour
+ Manufacturing Overhead .
= Total Production Costs

3. Calculate Costs of Goods Manufactured

Total Production Costs
+ Beginning Work In Process Inventory
- Ending Work in Process Inventory .
= Cost of Goods Manufactured

4. Calculate Costs of Goods Available For Sale

Cost of Goods Manufactured
+ Beginning Finished Goods Inventory .
= Cost of Goods Available for Sale

5. Calculate Cost of Goods Sold

Cost of Goods Available for Sale
- Ending Finished Goods Inventory .
= Cost of Goods Sold

Chapter 2 – Review Questions

Question 1:
Determine whether the following costs are variable, fixed or mixed; if they are product or period costs; and if they are direct or indirect:

Cost	Variable or Fixed?	Product or Period?	Direct or Indirect?
Raw Materials			
Advertising Expense			
Line Worker's Wages			
Janitorial Expense for the Factory			
Shipping expense			
Salary of the secretary at the head office			
Maintenance of the production machinery			

Answer 1:

Cost	Variable, Fixed or Mixed?	Product or Period?	Direct or Indirect?
Raw Materials	Variable	Product	Direct
Advertising Expense	Mixed	Period	Direct
Line Worker's Wages	Variable	Product	Direct
Wages for Janitorial Staff at the Factory	Variable	Product	Indirect
Shipping expense	Variable	Product	Direct
Salary of the secretary at the head office	Fixed	Period	Indirect
Maintenance of the production machinery	Variable	Product	Indirect

Question 2:

Manufacturing Plant Rent	$8,000
Work in Process, June 1	$100,000
Indirect Labour	$12,000
Finished Goods, June 1	$60,000
Direct Labour	$55,000
Direct Materials, June 31	$60,000
Direct Materials, June 1	$140,000
Direct Materials Purchases	$40,000
Work in Process, June 31	$85,000
Advertising Expense	$75,000
Finished Goods, June 31	$45,000

Given the above, calculate the following:

a) Total Manufacturing Overhead
b) Conversion Costs
c) Costs of Goods Sold

Answer 2:

Part A: Total Manufacturing Overhead

Indirect Labour	$12,000
Manufacturing Plant Rent	$8,000
Total Manufacturing Overhead	$20,000

Part B: Conversion Costs

Conversion Costs = Direct Labour + Manufacturing Overhead
Conversion Costs = $55,000 + $20,000 = $75,000

Part C: Manufacturing Plant Rent

1. Calculate Direct Materials Used

Direct Materials, June 1	$140,000
Direct Materials Purchases	$40,000
Direct Materials, June 31	($60,000)
Direct Materials Used in Production	$120,000

2. Calculate Total Product Costs

Direct Materials Used in Production	$120,000
Direct Labour	$55,000
Manufacturing Overhead	$20,000
Total Product Costs	$195,000

3. Calculate Cost of Goods Manufactured

Total Product Costs	$195,000
Beginning Work In Process Inventory	$100,000
Ending Work In Process Inventory	($85,000)
Cost of Goods Manufactured	$210,000

4. Calculate Cost of Goods Available For Sale

Cost of Goods Manufactured	$210,000
Beginning Finished Goods Inventory	$60,000
Cost of Goods Available For Sale	$270,000

Steps 4&5 can be combined if you are only required to calc COGS

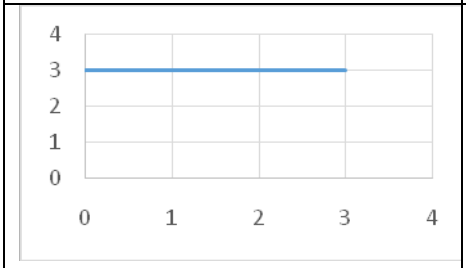
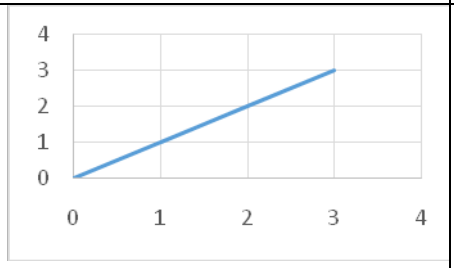
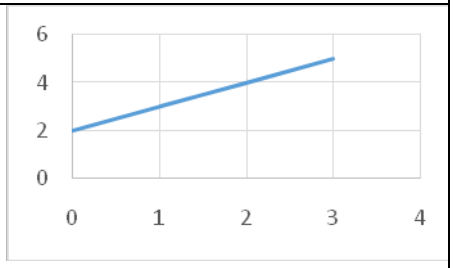
5. Calculate Cost of Goods Sold

Cost of Goods Available For Sale	$270,000
Ending Finished Goods Inventory	($45,000)
Cost of Goods Sold	$225,000

Chapter 3 – Cost Behaviour

In this chapter we will learn to understand how to group costs together depending on how they behave in relation to output.

We can classify costs into three groups based on their behavior:

Fixed Costs	Variable Costs	Mixed Costs
		
Fixed costs stay constant regardless of output. Ex. Rent, lease payments on a car, gym membership	Variable costs are directly proportional to the volume of output. Ex. Shipping expense is directly related to the number of shipments done, travel expenses are directly related to the number of flights taken.	Mixed costs are both fixed and variable. This means that a portion of the cost will need to be paid regardless of the output and that another portion is directly proportional to the volume of output.

For each cost, the "output" that is being measured differs. Each cost is proportionate to a **cost driver**. A **cost driver** is the underlying action or event that causes a cost to occur. To determine the cost driver ask yourself, "What causes this cost to go up or down?".

For example, the number of times I order pizza is the cost driver for my pizza expense, the number of months that I am subscribed to Netflix is the cost driver for my Netflix expense.

Fixed Costs

Discretionary vs. Committed Fixed Costs

Discretionary fixed costs are those that can be changed easily. These are things like a metro pass, although they are fixed for a period of time, you have the option to change the cost at will.

Committed fixed costs cannot be easily changed. Mortgages are a great example of committed fixed costs. Besides paying the entire mortgage or selling your house, there is little you can do to change this cost.

Unit Costs

When we refer to unit costs in this sense we mean per unit of product, not per unit of the cost driver. This a very important distinction to make.

Unit costs for Variable costs:

Example: Lightbulb Inc. manufacturers lightbulbs. For every lightbulb they produce, they require 1 steel filament that costs them $0.50 each. What is the variable cost per unit if they product 5,000 lightbulbs? 10,000? 20,000?

Total Variable Cost = Variable Cost per unit * # of units

Number of Light bulbs	Total Variable Cost	Variable Cost Per Light bulb
5,000	$2,500	$0.50
10,000	$5,000	$0.50
20,000	$10,000	$0.50

Variable cost per unit = Total Variable Cost/# of units produced

The Variable Cost per unit is also known as the **Variable Rate**.

Unit costs for Fixed costs:

Example: Lightbulb Inc. also pays $30,000 a month per rent for the manufacturing plant. Calculate the fixed costs per unit if they product 5,000 lightbulbs, 10,000, and 20,000.

Number of Light bulbs	Total Fixed Cost	Fixed Cost Per Light bulb
5,000	$30,000	$6
10,000	$30,000	$3
20,000	$30,000	$1.5

Fixed cost per unit = Total Fixed Cost/# of units produced

Note: this is how economies of scale work, as the number of units produced increase, the fixed cost per unit decreases. This lowers the cost to manufacture a product and increases profits.

Mixed Costs

Total Cost = Total Fixed Cost + Total Variable Cost

OR

Total Cost = Total Fixed Cost + (Variable Rate * # of units)

Mixed costs are costs that have both a fixed and a variable component.

For example: Electronics R Us is an electronics retail store. They have 4 sales representatives that are paid $1,000 each per month and $20 per sale of computer. If the sales staff sold 250 computers this month, what is the total cost of their salaries per month?

First, let's break this down into the fixed and variable components.

Since the $1,000 salary is on a monthly basis and stays constant no matter how many computers the staff sell, this is the fixed component. Electronics R Us employs 4 staff, therefore they will pay 4 x $1,000 in fixed costs per month

Total Fixed Costs = $1,000 * 4 = $4,000

In order to calculate the variable component of the total cost, we must identify the cost driver. Since the staff is paid $20 per sale of computer, the cost driver in this example is the number of computers sold.

Total Variable Cost = Commission per sale x # of computers sold

Total Variable Cost = $20 x 250 = $5,000

Total Cost = Total Fixed Cost + Total Variable Cost

Total Cost = $4,000 + $5,000 = $9,000

Predicting Mixed Costs:

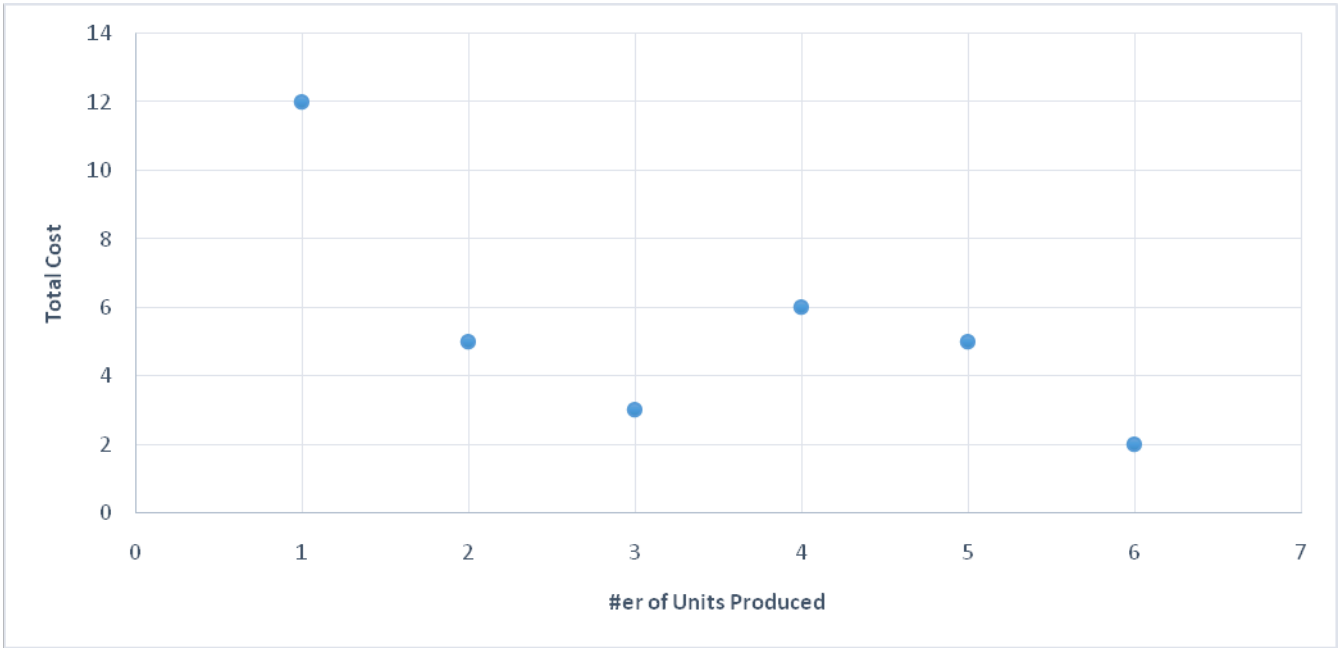
Part of the responsibilities of a managerial accountant or to **plan**. One of the most important things to plan are costs. Although fixed and variable costs are easy to predict, mixed costs are not as straight forward. To predict mixed costs we are going to create a cost formula.

Cost Formula: Total Cost = Fixed Costs + (Variable Rate * Output)

There are three methods to creating a cost formula:

1) High-Low Method
2) Scatter-Graph Method
3) Method of Least Squares

High-Low Method:



The High-Low method is the technique taught in high school to determine the formula for a line.

Total Cost = Variable Rate * Output

Y = mx + b

b --or the y-intercept-- is the fixed costs. The fixed costs are constant even when no units are produced.

m, or the slope, is the variable cost per unit. This is dependent on x – the # of units.

How to solve for the cost formula using the High-Low method:

Lightbulb Inc. wants to know the cost formula for their electricity costs. Given the following information gathered over the past year, provide the cost formula.

Month	Total Electricity Cots	Machine Hours
January	4000	350
February	3675	220
March	4350	375
April	3525	225
May	3500	200
June	3870	345
July	4120	355
August	4280	360
September	3740	300
October	3459	287
November	4240	323
December	4001	360

Step 1: Find the High and Low points

Find the highest and lowest output, never ever use the total cost to find the highest and lowest points.

High: $4,350 Electricity Cost and 375 Machine Hours
Low: $3,500 Electricity Cost and 200 Machine Hours

Step 2: Calculate the Variable Rate

Variable Rate = (High Cost – Low Cost)/(High Output – Low Output)
Variable Rate = ($4,350 - $3,500)/(375 – 200) = 850/175 = $4.86

Step 3: Calculate Fixed Costs

To calculate the fixed cost component of the cost formula, we will be using the same technique taught in high school.

At this point, the cost formula is as follows:

Total Cost = $4.86 * Output + Fixed Costs

In order to solve for the Fixed Costs, use either the high or low point in the formula:

High: $4,350 Electricity Cost and 375 Machine Hours

Total Cost = $4.86 * Output + Fixed Costs

$4,350 = $4.86*375 + Fixed Costs

$4,350 - $1,822.50 = Fixed Costs

Fixed Costs = $2,527.50

Step 4: Form the Cost Formula

Total Cost = $4.86*Output + $2,527.50

Check your answer:

If this is the correct formula, by inputting the low Output point, it should provide the corresponding total cost.

Low: $3,500 Electricity Cost and 200 Machine Hours

Total Cost = $4.86*Output + $2,527.50
Total Cost = $4.86*200 + $2,527.50
Total Cost = $972 + $2,527.50
Total Cost = $3,499.50 ~ $3,500

Benefits	Disadvantages
Easy to calculate	Only considers the High and Low point. May results in outlies that do not represent the cost-activity relationship.

2. Scatter Graph Method

The scatter graph method is also known as the line of best fit. When given a set of data points plotted on a graph, draw a line that looks like it represents the data. Use this line to determine the cost formula. This method is not very accurate.

3. Method of Least Squares

The method of least squares is a statistical approach to finding the a cost formula that best represents the given data. This method gives the best estimate of the relationship between fixed and variable costs and also indicates how accurate the estimate is. However, it is difficult to calculate without using software such as Excel or SPSS.

The output of the Method of Least Squares from Excel would provide the following:

Example:
Intercept: 500 → this is the fixed cost
X Variable: 3.50 → this is the variable rate
R^2: 0.67 → coefficient of determination

The R^2 indicates how much the total cost depends on the output. This number will always be in between 1 and 0.

An R^2 of 1 indicates that the total cost is completely dependent on the output, indicating that the total cost is composed entirely of variable costs.

An R^2 of 0 indicates that the total cost does not depend on the output, indicating that the total cost is composed entirely of fixed costs.

Using this information, the cost formula would be:

Total Cost = $3.50*Output + $500

Chapter 3 – Review Questions

Question 1:

The following question will refer to the following information:

Month	Total Electricity Costs	Machine Hours
January	$2,892	225
February	$3,117	380
March	$2,773	294
April	$1,900	130
May	$2,042	305
June	$2,104	205
July	$2,764	391
August	$1,850	128
September	$1,871	336
October	$2,185	336
November	$3,356	319
December	$2,438	283

a) Determine the cost formula to describe Total Electrical Costs
b) Use the cost formula to predict the expected Total Electricity Costs if 200 hours are used in the operation

Answer Below

Answer 1:

Part A

Step 1: Find High/Low Points

- High: $2,764 and 391 hours
- Low: $1,850 and 128 hours

Step 2: Calculate the Variable Rate

Variable rate = (High Cost - Low Cost)/(High Output - Low Output)
Variable rate = ($2,764 - $1,850)/(391 - 128)
Variable rate = $914/263 = $3.48 per machine hour

Step 3: Calculate Fixed Costs

High: $2,764 and 391 hours

Total Electricity Cost = variable rate*machine hours + fixed costs
$2,764 = $3.48*391 + fixed costs
$2,764 = $1,360.68 + fixed costs
fixed costs = $2,764 - $1,360.68
fixed costs = $1,403.32

Therefore, the cost formula is:

Total Electricity Cost = $3.48*Machine Hours + $1,403.32

CHECK:

Low: $1,850 and 128 hours

Total Electricity Cost = $3.48*128 + $1,403.32
Total Electricity Cost = $445.44 + $1,403.32
Total Electricity Cost = $1,848.76 ~ $1,850 round error due to round 3.475 to 3.48

PART B

Total Electricity Cost = $3.48*Machine Hours + $1,403.32
Total Electricity Cost = $3.48*200 + $1,403.32
Total Electricity Cost = $696 + $1,403.32
Total Electricity Cost = $2,099.32

Chapter 4 – Cost /Volume / Profit (CVP) Analysis

The following is a **Contribution Margin Income Statement**:

Company Name	XYZ		ABC	
Sales	$1,000,000	100%	$1,000,000	100%
Variable Costs	($650,000)	65%	($250,000)	25%
Contribution Margin	$350,000	35%	$750,000	75%
Fixed Costs	($100,000)	10%	($500,000)	50%
Operating Income	$250,000	25%	$250,000	25%

The Contribution Margin is the amount of money left over from a sale that can be used to pay for fixed costs and profits. Since manufacturing firms sell a product, with every sale, a cost is incurred. Therefore, the sales price is not the true amount of money made per sale, instead the contribution margin represents the actual amount of money made from the sales.

The contribution margin can be calculated in the following ways:

Total Contribution Margin = Total Sales – Total Variable Costs
OR
Total Contribute Margin = (# of units sold)*(Contribution Margin Per unit)
OR
Total Contribute Margin = Total Sales * Contribution Margin Ratio

Contribution Margin per unit = Price per unit – Variable Costs per unit

Contribution Margin Ratio = (Price per unit – Var Costs per unit)/Price per unit
OR
Contribution Margin Ratio = Contribution Margin per unit/Price per unit

Example:
Burger Place sells burgers for $10 each and incurs a variable cost of $4 per burger. If they sold 200 burgers today, what was their total contribution margin? Their contribution margin per unit? Their contribution margin ratio?

Contribution Margin per unit = Price per unit – Variable Costs per unit
Contribution Margin per unit = $10 - $4 = $6 per unit

Contribution Margin Ratio = (Price per unit – Variable Costs per unit)/Price per unit
Contribution Margin Ratio = ($10 - $4)/$10 = $6/$10 = 60%
OR
Contribution Margin Ratio = Contribution Margin per unit/Price per unit
Contribution Margin Ratio = $6/$10 = 60%

Total Contribute Margin = Total Sales – Total Variable Costs
Total Contribute Margin = $10*200 - $4*200 = $2,000 - $800 = $1,200
OR
Total Contribute Margin = (# of units sold)*(Contribution Margin Per unit)
Total Contribute Margin = 200*$6 = $1,200
OR
Total Contribute Margin = Total Sales * Contribution Margin Ratio
Total Contribute Margin = $2,000*0.60 = $1,200

Break-Even Point
The Break Even Point is the level of sales that must be achieved in order for the firm to not lose any money. Another way to describe this is that this is the level of sales where the total contribution margin is equal to the fixed costs; therefore profits are equal to zero.

Sales	$1,000,000
Variable Costs	($600,000)
Contribution Margin	$400,000
Fixed Costs	($400,000)
Operating Income	$0

The Break Event Point in sales dollars for this firm is $1,000,000; they must sell $1,000,000 worth of products in order to not lose money.

How to calculate Break Even Point

Break Even Point in units = Fixed Costs/Contribution Margin per unit
Break Even Point in Sales Dollar = Fixed Costs/Contribution Margin Ratio

Proof:
(Price – VC)(# units) – FC = Profit
When solving for BEP we are looking to only cover FC, therefore we are making 0 profit
(Price – VC)(# units) – FC = 0
(Price – VC)(# units) = CM/unit
CM/unit(# units) –FC = 0
CM(# units) = FC
units = FC/CM OR BEP units = FC/CM

Example:
Ditto Inc. sells extremely cheap cellphones to a very small market. The cost to make one cellphone is $95, which can be sold for $250. Ditto Inc. pays total fixed costs of $350,000 per year. What is the minimum amount of sales they must reach in order to break even? How many cell phones must Ditto Inc. sell?

Step 1: Calculate Contribution Margin per unit and Contribution Margin Ratio

Contribution Margin per unit = Price per unit – Variable Costs per unit
Contribution Margin per unit = $250 - $95 = $155

Contribution Margin Ratio = (Price per unit – VC per unit)/Price per unit
Contribution Margin per unit = ($250 - $95)/($250) = $155/$250 = 62%

Step 2: Calculate the Break Even Point in Sales Dollars and in Units

Break Even Point in units = Fixed Costs/Contribution Margin per unit
Break Even Point in units = $350,000/$155 = 2259
****NOTE: Always round up, it is impossible to sell 0.4 of a unit****

Break Even Point in Sales Dollar = Fixed Costs/Contribution Margin Ratio

Break Even Point in Sales Dollar = $350,000/0.62 = $564,516.13

Therefore, Ditto Inc. must sell 2258 cellphones in order to generate $564,516.13 and break even.

Multiple Product Break Even Point:

What if the company sells more than one product? How can the break even point be calculated considering multiple products?

Before we can solve for the break even point of a firm that sells multiple products, we will need to make one large assumption that the products are sold in a fixed proportion to each other. For example, this means that we will assume McDonalds will always sell 2 apple pies for every sundae sold.

Example:

Ditto Inc. manufactures electronics headphones, cellphones, and cellphone cases. This past year they sold 4,000 headphones, 2,000 cellphones, and 1,000 cellphone cases. Ditto Inc. pays $600,000 in fixed costs per year. Headphones are sold for $20 and cost $10 to make, cellphones are sold for $250 and cost $95 to make, cellphone cases are sold for $10 and cost $5 to make.

How many headphones, cellphones, and cellphone cases must Ditto Inc. sell this year to break even?

Step 1: Determine the fixed ratio of goods

This step is where the assumption is made that these goods will always be sold in a fixed proportion to each other. If this ratio is not provided in the quest, find the smallest whole-number ratio of the previous sales of the products.

4,000 headphones:2,000 cellphones:1,000 cellphone cases
4:2:1

Therefore, fixed ratio will be 4 headphones to 2 cellphones to 1 cellphone case.

Step 2: Calculate the Contribution Margin per package

Using the fixed ratio, we will create a "package" of goods that contains 4 headphones, 2 cellphones, and 1 cellphone case. This package will be treated as a single product.

(Example Continues on next page)

	Selling Price	**Variable Cost**	**Contribution Margin**	**Ratio**	**Calculation**	**Package Contribution Margin**
Headphones	$20	$10	$10	4	4*$10 =	$40
Cellphones	$250	$95	$155	2	2*$155 =	$310
Cellphone Cases	$10	$5	$5	1	1*$5 =	$5
					Total	$355

Therefore, the contribution margin per unit of this package of goods is $355.

Step 3: Calculate the Break Even Point in Number of Packages

Break Even Point in units = Fixed Costs/Contribution Margin per unit

Break Even Point in units = $600,000/$355

Break Even Point in Number of Packages = 1,690.14 ~ 1,691

Step 4: Determine the Break Even Point for each product

Given that each package contains 4 headphones, 2 cellphones, and 1 cellphone case and that the break even point in number of packages is 1,691 packages:

Product	**Ratio**	**BEP in Packages**	**BEP in Product**
Headphones	4	1,691	6,764
Cellphones	2	1,691	3,382
Cellphone Cases	1	1,691	1,691

Units to be sold to achieve a Target Income:

If the break even point formula calculates the number of units a company needs to sell to make $0 in income then:

Break Even Point in units = (Fixed Costs + $0 Income) /Contribution Margin per unit

Using this same formula a firm can calculate the # of units that must be sold to make a targeted income:
# of units to earn a target income = (Fixed Costs + Target Income) / Contribution Margin per unit

Cost Volume Profit Analysis and Risk

The **Margin of Safety** is a measure of a company's current sales status in comparison to its break even point. This tells the business how much sales can drop before reaching the break-even point and is a measure of risk.
Margin of Safety = Current Sales – BEP Sales

Operating Leverage describes the relationship between fixed and variable costs. Firms taking advantage of operating leverage increase their fixed costs by automating operations and thus reducing variable costs. This is an application of economies of scale.

While operating leverage is an effective tool for increasing profits, it also increases risk.

The impact of operating leverage can be calculated by applying the **degree of operating leverage**.

Degree of operating leverage = Contribution margin/Operating income

Percentage change in operating income = DOL × Percentage change in sales

The following example compares two companies with the same sales but different cost structures:

	XYZ	ABC
Sales	$1,000,000	$1,000,000
Variable Costs	$650,000	$250,000
Contribution Margin	$350,000	$750,000
Fixed Costs	$100,000	$500,000
Operating Income	$250,000	$250,000

Degree of operating leverage of XYZ = $350,000/$250,000 = 1.4
Degree of operating leverage of ABC = $750,000/$250,000

	Decrease 20%	XYZ	Increase 20%
Sales	$800,000	$1,000,000	$1,200,000
Variable Costs	$520,000	$650,000	$780,000
Contribution Margin	$280,000	$350,000	$420,000
Fixed Costs	$100,000	$100,000	$100,000
Operating Income	$180,000	$250,000	$320,000
Change in OI	-28%		28%

Percentage change in operating income for XYZ = 1.4*(+/-20%) = +/-28%

	Decrease 20%	ABC	Increase 20%
Sales	$800,000	$1,000,000	$1,200,000
Variable Costs	$200,000	$250,000	$300,000
Contribution Margin	$600,000	$750,000	$900,000
Fixed Costs	$500,000	$500,000	$500,000
Operating Income	$100,000	$250,000	$400,000
	-60%		60%

Percentage change in operating income for ABC = 3*(+/-20%) = +/-60%

Chapter 4 – Review Question

KeepKleen manufactures high-end mops, below is the projected contribution income statement for the year 2017:

Sales (40,000 units @ $45)	$1,800,000
Less: Variable Costs	$(800,000.00)
Contribution Margin	$1,000,000
Less: Fixed Costs	$(600,000.00)
Operating Income	$400,000

a. Calculate the contribution margin per unit and the contribution margin ratio
b. Calculate the break even point in sales and in units
c. Calculate the margin of safety
d. Calculate the number of units that must be sold in order to generate a profit of $3,000,000
e. The head of marketing has decided to introduce a digital media ad campaign that will cost $250,000. This will result in a $700,000 increase in sales. How will this impact operating income?
f. Calculate the degree of operating leverage based on the original information. If sales increase by 20%, by how much will operating income increase?

Answer Below:

Answers:

Part A

Contribution Margin Ratio = Contribution Margin/Sales
Contribution Margin Ratio = $1,000,000/$1,800,000
Contribution Margin Ratio = 0.5555556
*Try not to round this number since it impacts other questions

Contribution Margin per unit = Price per unit – Variable Cost per unit
Contribution Margin per unit = $45 – ($800,000/40,000)
Contribution Margin per unit = $45 - $20 = $25

Part B

Break even point in units = Fixed Costs/Contribution Margin per unit
Break even point in units = $600,000/$25 = 24,000

Break even point in sales = Fixed Costs/Contribution Margin Ratio
Break even point in sales = $600,000/0.5555556 = $1,079,999.91 ~ $1,080,000

Part C

Margin of Safety = Current Sales – Break even point sales
Margin of Safety = $1,800,000 - $1,080,000 = $720,000

Part D

Calculate the number of units that must be sold in order to generate a profit of $3,000,000
Units to earn Target Income = (Fixed Costs + Target Income)/Contribution Margin per Unit
Units to earn Target Income = ($600,000 + $3,000,000)/$25
Units to earn Target Income = $3,600,000/$25 = 144,000 units

Part E

The head of marketing has decided to introduce a digital media ad campaign that will cost $250,000. This will result in a $700,000 increase in sales. How will this impact operating income?

	Current	New
Sales (40,000 units @ $45)	$1,800,000	$2,500,000
Less: Variable Costs	$(800,000.00)	$(1,111,111.11)
Contribution Margin	$1,000,000	$1,388,888.89
Less: Fixed Costs	$(600,000.00)	$($850,000)
Operating Income	$400,000	$538,888.89

New sales in units = $2,500,000/$45 = 55,555.5556
New Variable Costs = 55,555.5556 * $20 = $1,111,111.11
New income – old income = $538,888.89 - $400,000 = $138,888.89 Increase in operating Income

Part F

Calculate the degree of operating leverage based on the original information. If sales increase by 20%, by how much will operating income increase?
Degree of Operating Income = Contribution Margin/Operating Income
Degree of Operating Income = $1,000,000/$400,000 = 2.5

Change in income = change in sales * Degree of Operating Leverage
Change in income = 20% * 2.5 = 50%

Operating income will increase by 50% if sales increase by 20%.

Chapter 5 – Job Order Costing

Some companies produce and sell many custom-built things that may be similar to one another in function, but have entirely different costs. These companies use **Job Order Costing** to account for their business.

Job Order Costing is the concept of counting the costs of a product on a job by job basis.

The cost of the job is broken down into 3 things:

- Direct Material
- Direct Labour
- Overhead

Direct material and direct labour are by definition, easy to trace to each job. However, overhead is not as simple. This chapter will focus on the techniques used to allocate the correct amount of overhead to each job.

Normal vs. Actual Costing

Normal Costing:

- Actual Direct Materials
- Actual Direct Labour
- Applied Overhead

Normal costing is a technique in job order costing where the overhead is applied (i.e. estimated) in order to provide information to decision makers quickly. Since overhead consists of costs like electricity, it is difficult to be accurate on its allocation at all times of the project. In order to be 100% accurate, the overhead must be allocated when the electricity bill is received. **During the month** accountants use normal costing to account for jobs.

Actual Costing:

- Actual Direct Materials
- Actual Direct Labour
- Actual Overhead

Once the overhead has been determined – usually at the end of the month or year when the bills are received – the actual overhead can be allocated. This is the cost of the job that will be recorded on the income statement.

Example:
At the beginning of the year, Kensington Co. estimated the following costs
Overhead = $600,000
Direct Labour Cost = $800,000

During the month of March, Kensington Co. had the following jobs:

	Job 121	Job 122	Job 123	Job 124
Balance, Mar 1	$10,000	0	0	0
Direct Materials	$12,000	$6,500	$10,000	$8,000
Direct Labour	$4,000	$1,800	$3,000	$2,700
Applied Overhead				
Balance, Mar 31				

At the end of the month, Kensington Co. had completed Job 121 and Job 124, and Job 121 was sold.

a) Complete the Job Order Cost sheet for the month of March by calculating the balance of each job on March 31
b) Calculate the balance of the Work In Progress account
c) Calculate the balance of the Finished Goods account
d) Calculate the Cost of Goods Sold
e) If Kensington Co. had determined that the actual overhead costs at the end of the year was $600,500 and the unadjusted COGS was $990,000, calculate the adjusted COGS if they had $820,000 in Direct Labour cost for the year.

Part A
(TIP) 3 Steps to Applying Overhead:

I. Calculate the pre-determined overhead rate
II. Apply the overhead rate to determine the applied overhead
III. Compare the actual; and applied overhead to determine the overhead variance
***NOTE: The question does not ask to do step 3

Step 1: Calculate the pre-determined overhead rate

Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Activity Level

Using the estimated costs at the **beginning** of the year, calculate the pre-determined overhead rate. In this case, the activity level is Direct Labour Cost.

> Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Direct Labour Cost
>
> Pre-determined overhead rate = $600,000/$800,000 = 0.75

This means that for every dollar spent in Direct Labour, we will apply $0.75 in Overhead.

Step 2: Apply the overhead rate to determine the applied overhead

> Applied Overhead = Pre-determined Overhead Rate * Actual Direct Labour Cost

During the year, we apply the overhead rate to the actual direct labour cost incurred per job to allocate applied overhead.

	Job 121	Job 122	Job 123	Job 124
Balance, Mar 1	$10,000	0	0	0
Direct Materials	$12,000	$6,500	$10,000	$8,000
Direct Labour	$4,000	$1,800	$3,000	$2,700
Applied Overhead	$3,000	$1,350	$2,250	$2,025
Balance, Mar 31	$29,000	$9,650	$15,250	$12,725

Calculations:

- Job 121: Applied Overhead = $4,000*0.75 = $3,000
- Job 122: Applied Overhead = $1,800*0.75 = $1,350
- Job 123: Applied Overhead = $3,000*0.75 = $2,250
- Job 124: Applied Overhead = $2,700*0.75 = $2,025

Part B

Since the only jobs that were not finished or sold are 122 and 123 the balance of the Work in Progress account is:

> Work in Progress = Job 122 + Job 123 = $9,650 + $15,250 = $24,900

Part C

Since Job 124 was completed but not sold, it is the only job in the Finished Goods account.

Finished Goods = Job 124 = $12,725

Part D

Since job 121 was the only job both completed and sold, it is the only job in the COGS account.

COGS = Job 121 = $29,000

Part E

Now we must use step 3 in the 3 step process of Calculate, Apply, Compare.

Step 3: Compare the actual and applied overhead to determine the overhead variance

Overhead Variance = Actual Overhead – Applied Overhead

- Actual Overhead > Applied Overhead = + Variance → Under applied overhead
- Actual Overhead < Applied Overhead = - Variance → Over applied overhead

Applied Overhead = Pre-determined Overhead Rate * Actual Direct Labour Cost
Applied Overhead = 0.75*820,000 = 615,000
Overhead Variance = $600,500 - $615,000 = -$14,500 → Over applied overhead

Now we must calculate the adjusted COGS

Unadjusted COGS	$990,000
Overhead Variance	($14,500)
Adjust COGS	$975,500

Leave the sign of the overhead variance as it is, add or subtract to the unadjusted COGS depending on the sign.
(END OF EXAMPLE)

Plant wide vs. Departmental Overhead Rates

So far we have allocated overhead based on the assumption that all of the overhead for the organization is driven by a single cost driver. This is called calculating a **Plant Wide Overhead Rate** since one rate is used for the entire organization.

In some organizations, the overhead cost is driven by different cost drivers depending on the department. For each department, the company calculates an overhead rate based on the cost driving activity. This is called using a **Departmental Overhead Rate**.

Example 2:

Queen West Co. manufacturers hipster bike helmets. They have two departments, assembly and production. Queen West Co. uses departmental overhead rates to apply overhead. Overhead in the assembly department is allocated based on direct labour hours and in the production department by machine hours.

At the beginning of the year, Queen West Co. estimated:

	Assembly Dept.	Production Dept.	Total
Overhead Cost	$450,000	$300,000	$750,000
Direct Labour Hours	60,000	30,000	90,000
Machine Hours	0	50,000	50,000

The actual data for the month of March is as follows:

	Assembly Dept.	Production Dept.	Total
Overhead Cost	$40,000	$25,000	$65,000
Direct Labour Hours	5,000	2,500	$7,500
Machine Hours	0	4,200	$4,200

How much overhead was underapplied or overapplied for each department?

Answer: 3 Steps

I. Calculate the pre-determined overhead rate
II. Apply the overhead rate to determine the applied overhead
III. Compare the actual and applied overhead to determine the overhead variance

(Please See Chart On Following Page)

Assembly Dept.	Production Dept.
Step 1: Calculate the pre-determined overhead rate Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Activity Level	
Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Direct Labour Hours Pre-determined Overhead Rate = $450,000/60,000 = $7.5 overhead per DLH	Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Machine Hours Pre-determined Overhead Rate = $300,000/50,000 = $6 overhead per machine hour
Step 2: Apply the overhead rate to determine the applied overhead Applied Overhead = Pre-determined Overhead Rate * Actual Activity Level	
Applied Overhead = Pre-determined Overhead Rate * Actual Direct Labour Hours Applied Overhead = $7.5*5,000 = $37,500	Applied Overhead = Pre-determined Overhead Rate * Actual Machine Hours Applied Overhead = $6*4,200 = $25,200
Step 3: Compare the actual & applied overhead to determine the overhead variance Overhead Variance = Actual Overhead – Applied Overhead	
Overhead Variance = $40,000 - $37,500 = $2,500 underapplied	Overhead Variance = $25,000 - $25,200 = -$200 overapplied

Chapter 5 – Review Questions

Question 1:

Computer Components Inc. estimated the following at the beginning of 2017:

	Testing Dept.	*Production Dept.*	*Total*
Overhead Cost	$800,000	$550,000	$1,350,000
Direct Labour Hours	100,000	45,000	$145,000
Machine Hours	5,000	55,000	$60,000

The actual data collected for the month of April is as follows:

	Testing Dept.	*Production Dept.*	*Total*
Overhead Cost	$70,000.00	$47,000.00	$117,000
Direct Labour Hours	10,000	2,500	$12,500
Machine Hours	200	5,000	$5,200

Computer Components Inc. uses departmental overhead rates. Overhead is allocated by direct labour hours in the Testing Department and by machine hours in the Production Department.

a. Calculate the predetermined overhead rates for each department
b. Calculate the applied overhead for each department in the month of April
c. Is overhead underapplied or overapplied in each department for the month of April?

Answer 1:

Part A

Predetermined overhead rate = Estimated Annual Overhead / Estimated Annual Activity Level

Testing Department:

Predetermined overhead rate = Estimated Annual Overhead / Estimated Annual Direct Labour Hours

Predetermined overhead rate = $800,000/100,000 = $8 per DLH

Production Department:

Predetermined overhead rate = Estimated Annual Overhead / Estimated Annual Machine Hours

Predetermined overhead rate = $550,000/55,000 = $10 per machine hour

Part B

Calculate the applied overhead for each department in the month of April

Applied Overhead = predetermined overhead rate * actual activity level

Testing Department:

Applied Overhead = predetermined overhead rate * actual activity level

Applied Overhead = predetermined overhead rate * actual direct labour hours

Applied Overhead = $8 * 10,000 = $80,000

Production Department:

Applied Overhead = predetermined overhead rate * actual activity level

Applied Overhead = predetermined overhead rate * actual machine hours

Applied Overhead = $10 * 5,000 = $50,000

Part C

Is overhead underapplied or overapplied in each department for the month of April?

Overhead variance = Actual Overhead – Applied Overhead

Testing Department:

Overhead variance = Actual Overhead – Applied Overhead

Overhead variance = $70,000 - $80,000 = -$10,000 overapplied

Production Department:

Overhead variance = Actual Overhead – Applied Overhead

Overhead variance = $47,000 - $50,000 = -$3,000 overapplied

Question #2:

Patio King is a custom patio builder, building patios for high-end homes. The following data has been collected on the 4 patios they are currently building:

	Job 56	Job 57	Job 58	Job 59
Balance, April 1	$13,000	0	0	0
Direct Materials	$8,000	$10,000	$14,000	$12,000
Direct Labour	$4,500	$7,000	$9,000	$7,200

Patio King allocates overhead using a predetermined overhead rate of 50% of Direct Labour Cost. Job 56 was started in March and sold in April. Job 57 and 58 were both completed by April 30. Job 59 was not complete on April 30th.

Using the above information, answer the following:

a. Create a job order cost sheet showing the balances for each job on April 30th
b. What are the balances in Work in Process, Finished Goods, and Costs of Goods Sold?
c. If jobs are sold at cost + 50%, what were Patio King's sales in April?

(Space to work on previous question)

Answer 2:

Part A

	Job 56	Job 57	Job 58	Job 59
Balance, April 1	$13,000	0	0	0
Direct Materials	$8,000	$10,000	$14,000	$12,000
Direct Labour	$4,500	$7,000	$9,000	$7,200
Applied Overhead	$2,250	$3,500	$4,500	$3,600
Balance, Mar 31	$27,750	$20,500	$27,500	$22,800

Calculations:
Job 56: Applied Overhead = $4,500*0.5 = $2,250
Job 57: Applied Overhead = $7,000*0.5 = $3,500
Job 58: Applied Overhead = $9,000*0.5 = $4,500
Job 59: Applied Overhead = $7,200*0.5 = $3,600

Part B
What are the balances in Work in Process, Finished Goods, and Costs of Goods Sold?

Work in Process: Job 59 = $22,800
Finished Goods: Job 57 and Job 58 = $20,500 + 27,500 = $48,000
Costs of Goods Sold: Job 56 = $27,750

Part C
If jobs are sold at cost + 50%, what were Patio King's sales in April?
Job 56 costed $27,750.

Selling Price = Cost * (1+Markup)
Selling Price = $27,750 * (1+0.50)
Selling Price = $41,625

Chapter 7 – Activity Based Costing

What is Activity Based Costing?

Activity Based Costing is used to break down costs that are hard to trace based on their individual drivers.

In the past, we learned how to assign indirect costs to cost objects using plant-wide and departmental overhead rates, ABC costing uses the exact same principles with a focus on the individual activity.

Plantwide Overhead Rates

1. Calculate the pre-determined overhead rate
    i. Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Activity Level
2. Apply the overhead rate to determine the applied overhead
    i. Applied Overhead = Pre-determined Overhead Rate * Actual Activity Level
3. Compare the actual and applied overhead to determine the overhead variance
    i. Overhead Variance = Actual Overhead – Applied Overhead

Departmental Rates

Assembly Dept.	Production Dept.
Step 1: Calculate the pre-determined overhead rate Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Activity Level	
Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Direct Labour Hours	Pre-determined Overhead Rate = Estimated Annual Overhead / Estimated Annual Machine Hours
Step 2: Apply the overhead rate to determine the applied overhead Applied Overhead = Pre-determined Overhead Rate * Actual Activity Level	
Applied Overhead = Pre-determined Overhead Rate * Actual Direct Labour Hours	Applied Overhead = Pre-determined Overhead Rate * Actual Machine Hours
Step 3: Compare the actual & applied overhead to determine the overhead variance Overhead Variance = Actual Overhead – Applied Overhead	

*****Exam Tips*****

1. The first step always uses the budgeted values… this means they are estimates/guesses that are determined in the beginning of the year
2. Budgeted =/= Applied. The Budgeted is an estimate, the applied is the budgeted overhead rate applied to the actual activity level
3. Always be careful to read the activity driver for each question, whether solving for the plant-wide, departmental, or activity based overhead rates

In Activity Based Costing, we will apply only the first 2 steps for each individual activity.

Methods of Activity Based Costing

There are two methods to do ABC costing that will end up at the same result:

1. Activity Rate
    a. This is a cost per driver
2. Consumption Rates
    a. This is the percentage of the total activity level that each cost object has consumed

Activity Based Costing Example

Nosy Inc. produces two products: high-end sunglasses and inexpensive sunglasses. The two products use four overhead activities, which share the following costs:

Setting up equipment $30,000
Machining $112,000
Inspections $40,000
Assembly $60,000

The controller has collected the expected annual prime costs for each product, the setup hours, the machine hours, inspections hours, the direct labour hours, and the expected production.

	High-end	Inexpensive
Direct Labour	$44,000	$9,000
Direct Materials	$16,000	$3,000
Units Produced	4,000	8,000
Setup Hours	250	50
Machine Hours	2,000	6,000
Inspection Hours	300	100
Direct Labour Hours	500	1,000

a) Calculate the Overhead Costs for the High-end and Inexpensive sunglasses using the activity rates
b) Calculate the Overhead Costs for the High-end and Inexpensive sunglasses using consumption ratios
c) Calculate the per unit costs for the High-end and Inexpensive sunglasses

ANSWERS

a) Calculate the Overhead Costs for the High-end and Inexpensive sunglasses using the activity rates

1. To calculate the activity rates, you must first identify the costs and its related activity. This should either be obvious or the question will specify these. Use your best judgement.

Activity	Activity Driver
Setting up equipment	Setup Hours
Machining	Machine Hours
Inspections	Inspection Hours
Assembly	Direct Labour Hours

2. Calculate the activity rates. (Activity Rate = Activity Cost/Total Activity Level)

Activity	Total Activity Cost	Total Activity Level	Activity Rate
Setting up equipment	$30,000	300	$100 per Setup Hour
Machining	$112,000	8,000	$14 per Machine Hour
Inspections	$40,000	400	$100 per Inspection Hour
Assembly	$60,000	1,500	$40 per DL Hours

3. Apply the Activity Rates to each product based on their activity level

Activity costs assigned to cost object = Activity Rate * Level of Activity consumed by cost object

Activity	Activity Rate	High-end Activity Level	High-end Activity Costs
Setting up equipment	$100 per Setup Hour	250	$25,000
Machining	$14 per Machine Hour	2,000	$28,000
Inspections	$100 per Inspection Hour	300	$30,000
Assembly	$40 per DL Hours	500	$20,000
		Total	$103,000

Activity	Activity Rate	Inexpensive Activity Level	Inexpensive Activity Costs
Setting up	$100 per Setup Hour	50	$5,000

equipment			
Machining	$14 per Machine Hour	6,000	$84,000
Inspections	$100 per Inspection Hour	100	$10,000
Assembly	$40 per DL Hours	1,000	$40,000
		Total	$139,000

b) Calculate the Overhead Costs for the High-end and Inexpensive sunglasses using the activity rates

1. To calculate the consumption ratios, you must first identify the costs and its related activity just like you did for the Activity Rates method. This should either be obvious or the question will specify these. Use your best judgement.

Activity	Activity Driver
Setting up equipment	Setup Hours
Machining	Machine Hours
Inspections	Inspection Hours
Assembly	Direct Labour Hours

2. Calculate the consumption ratios for each activity

Consumption Ratio = Activity Level used by Cost Object / Total Activity Level

	High-end	Inexpensive	Total
Setup Hours	250	50	300
Machine Hours	2,000	6,000	8,000
Inspection Hours	300	100	400
Direct Labour Hours	500	1,000	1,500

Consumption Ratios:

	High-end	Inexpensive	Total
Setup Hours	250/300 = 83%	50/300 = 17%	300
Machine Hours	2,000/8,000 = 25%	6,000/8,000 = 75%	8,000
Inspection Hours	300/400 = 75%	100/400 = 25%	400
Direct Labour Hours	500/1,500 = 33%	1,000/1,500 = 67%	1,500

3. Apply the consumption ratios

Activity costs assigned to cost object = Consumption Ratio * Total Activity Cost

	Total Activity Cost	High-end Consumption Ratios	Total
Setup Hours	$30,000	83%	$25,000
Machine Hours	$112,000	25%	$28,000
Inspection Hours	$40,000	75%	$30,000
Direct Labour Hours	$60,000	33%	$20,000
		Total	$103,000

	Total Activity Cost	Inexpensive Consumption Ratios	Total
Setup Hours	$30,000	17%	$5,000
Machine Hours	$112,000	75%	$84,000
Inspection Hours	$40,000	25%	$10,000
Direct Labour Hours	$60,000	67%	$40,000
		Total	$139,000

c) Calculate the per unit costs for the High-end and Inexpensive sunglasses

	High-end	Inexpensive
Total Overhead Costs	$103,000	$139,000
Direct Labour	$44,000	$9,000
Direct Materials	$16,000	$3,000
Total Product Costs	**$163,000**	**$151,000**
Units Produced	4,000	8,000
Total Cost Per Unit	**$163,000/4,000 = $40.75**	**$151,000/8,000 = $18.88**

Value Added Activities:
Due to our focus on each activity, we can start to reduce our costs based on their value.

Value Added Activities are necessary to remain in business, there are two types:

1. Value-added by mandate, ex. Environmental regulations require you to recycle all unused raw materials
    a. These are activities that a business must perform
2. Discretionary Value-added activities, ex. Machining
    a. These are activities that add value, but are not mandatory

NOTE Non-Value Added Activities are all activities that are not absolutely necessary to remain in business, ex. Moving, scheduling, inspecting, storing.

Assessing non-value-added costs:

1. Your company currently performs warranty work at a cost of $80,000
    a. The warranty costs of the most efficient competition is $25,000
2. Your company currently assembles components at a cost of $100,000 for 10,000 hours
    a. A Benchmark study reveals that the most efficient level would use 5,000 hours with a cost of $50,000

Determine the non-value-added costs for each activity:

1. Warranty Work

Since this is a non-value added cost, the total $80,000 is non-value added. The cause of this cost is due to faulty products.

2. Assembly

Since this is a value-added cost, the non-value-added component is the additional cost caused by inefficiencies.

Therefore, the non-value-added costs:

Non-value-added costs = actual costs – benchmark costs
Non-value-added costs = $100,000 - $50,000 = $50,000

Performance Measures:

Velocity and Cycle time are metrics used to measure the production performance of a company. They are reciprocals of each other.

Velocity = # of Units Produced/Hours needed to Produce

Cycle Time = Hours needed to Produce/# of Units Produced

Example:
A company takes 20,000 hours to produce 80,000 products. What is the velocity and cycle time for this company?

Answers:
Velocity = 80,000/20,000 = 4 units per hour
Cycle Time = 20,000/80,000 = 0.25 hours per unit

Chapter 7 – Review Questions

Question 1:

Print Co. products two printers - Colour and Black & White. The following information was collected from their production facility.

Activity Name	Activity Driver	Activity Cost	Colour	Black & White
Setups	# of Setups	$10,000,000	600	400
Machining	Machine Hours	$60,000,000	100,000	300,000
Engineering	Engineering Hours	$4,000,000	200,000	200,000
Packaging	# of orders Packaged	$1,200,000	360,000	120,000

1. Calculate the overhead rates for each activity
2. Calculate the Consumption Ratios for each activity
3. Calculate the total overhead costs for each printer

ANSWERS

1. Calculate the overhead rates for each activity

Activity Name	Total Activity Cost	Total Activity Level	Activity Rate
Setups	$10,000,000	1,000	$10,000.00
Machining	$60,000,000	400,000	$150.00
Engineering	$4,000,000	400,000	$10.00
Packaging	$1,200,000	480,000	$2.50

2. Calculate the Consumption Ratios for each activity

Activity Name	Colour	Black & White
Setups	0.60	0.40
Machining	0.25	0.75
Engineering	0.50	0.50
Packaging	0.75	0.25

3. Calculate the total overhead costs for each printer

Using Activity Rates

Activity Name	Activity Rate	Colour	Black & White
Setups	$10,000.00	$6,000,000	$4,000,000
Machining	$150.00	$15,000,000	$45,000,000
Engineering	$10.00	$2,000,000	$2,000,000
Packaging	$2.50	$900,000	$300,000
	Total	$23,900,000	$51,300,000

Calculations:

Colour:			
Activity Name	Activity Rate	Colour	Activity Cost
Setups	$10,000.00	600	$6,000,000
Machining	$150.00	100,000	$15,000,000
Engineering	$10.00	200,000	$2,000,000
Packaging	$2.50	360,000	$900,000
		Total	$23,900,000

Black & White			
Activity Name	Activity Rate	Black & White	Activity Cost
Setups	$10,000.00	400	$4,000,000
Machining	$150.00	300,000	$45,000,000
Engineering	$10.00	200,000	$2,000,000
Packaging	$2.50	120,000	$300,000
		Total	$51,300,000

Using Consumption Ratios

Activity Name	Total Activity Cost	Colour	Black & White
Setups	$10,000,000	$6,000,000	$4,000,000
Machining	$60,000,000	$15,000,000	$45,000,000
Engineering	$4,000,000	$2,000,000	$2,000,000
Packaging	$1,200,000	$900,000	$300,000
	Total	$23,900,000	$51,300,000

Calculations:

Colour:			
Activity Name	Total Activity Cost	Colour Consumption Ratios	Activity Cost
Setups	$10,000,000	0.60	$6,000,000
Machining	$60,000,000	0.25	$15,000,000
Engineering	$4,000,000	0.50	$2,000,000
Packaging	$1,200,000	0.75	$900,000
		Total	$23,900,000

Black & White:			
Activity Name	Total Activity Cost	Black & White Consumption Ratios	Activity Cost
Setups	$10,000,000	0.40	$4,000,000
Machining	$60,000,000	0.75	$45,000,000
Engineering	$4,000,000	0.50	$2,000,000
Packaging	$1,200,000	0.25	$300,000
		Total	$51,300,000

Question 2:

Udex Co. uses activity based costing to determine the costs of its products. They estimate the following total costs and activity levels for each of their three activities.

		Expected Activity Levels		
Activities	Estimated Costs	Product XY	Product AB	Total
Preparing Materials	$30,000	1,200	1,800	3,000
Quality Assurance	$24,000	3,700	2,300	6,000
Distribution	$45,000	7,500	1,500	9,000

Calculate the total overhead assigned for both Product XY and Product AB

ANSWER

Using Activity Rates

Step 1: Calculate the Activity Rates for each activity

Activity Name	Total Costs	Total Activity Level	Activity Rate
Preparing Materials	$30,000	3,000	$10
Quality Assurance	$24,000	6,000	$4
Distribution	$45,000	9,000	$5

Step 2: Apply the activity rates to each product

Product XY			
Activity Name	Activity Rate	Product XY Activity	Activity Cost
Preparing Materials	$10.00	1,200	$12,000
Quality Assurance	$4.00	3,700	$14,800
Distribution	$5.00	7,500	$37,500
		Total	$64,300

Product AB			
Activity Name	Activity Rate	Product AB Activity	Activity Cost
Preparing Materials	$10.00	1,800	$18,000
Quality Assurance	$4.00	2,300	$9,200
Distribution	$5.00	1,500	$7,500
		Total	$34,700

Using Consumption Ratios

Step 1: Calculate the consumption ratios

Activity Name	Total Activity Level	Product XY Activity	Product XY Consumption Ratio
Preparing Materials	3,000	1,200	0.40
Quality Assurance	6,000	3,700	0.62
Distribution	9,000	7,500	0.83

Step 2: Apply the consumption ratios

Product XY			
Activity Name	Total Costs	Product XY Consumption Ratio	Activity Cost
Preparing Materials	$30,000	0.40	$12,000
Quality Assurance	$24,000	0.62	$14,800
Distribution	$45,000	0.83	$37,500
		Total	$64,300

Product AB			
Activity Name	Total Costs	Product AB Consumption Ratio	Activity Cost
Preparing Materials	$30,000	0.60	$18,000
Quality Assurance	$24,000	0.38	$9,200
Distribution	$45,000	0.17	$7,500
		Total	$34,700

Chapter 9 – Budgets

What are Budgets?

Budgets are the plans managerial accountants use to calculate everything the business needs, well in advance. The budgets are all based on the **demand**, the demand of the products (a.k.a Sales) determines the production levels that the company must meet in order to be successful.

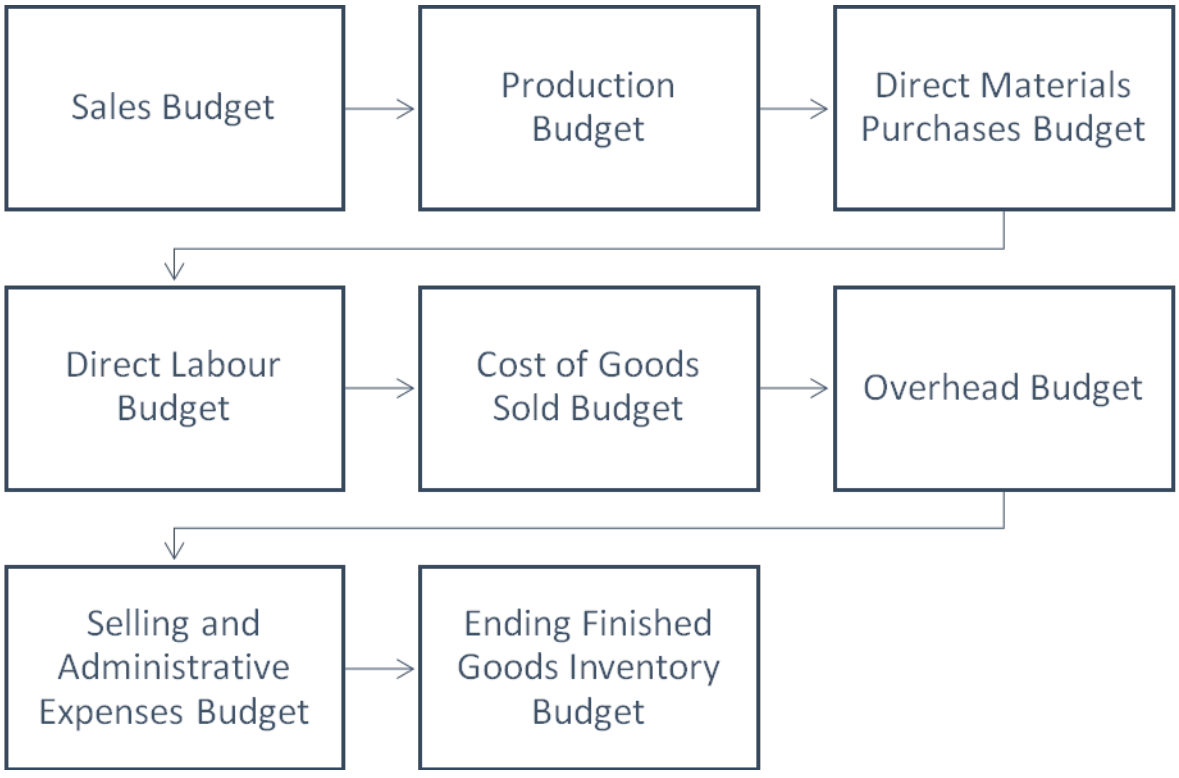
Types of Budgets:

Budgets can be broken down into 2 major groups:

4) Operating Budgets
    a. Plans regarding the costs of producing goods
5) Financial Budgets
    a. Plans regarding the receipt and payment of cash

All of the budgets are consolidated into on **Master Budget**. The Master budget details the cash collected and the cash spent for all of the businesses activities.

Operating Budgets



Financial Budgets

Examples:

Sales Budget

Interlek Inc. sells speakers and expects the following number of units to be sold in the first quarter of the year:

January 50,000
February 45,000
March 48,000

The average price per unit is $35. Prepare a Sales Budget for the first three months and for the quarter as a whole.

ANSWER

Interlek Inc.
Sales Budget
For the period ending March 31, 2017

	January	February	March	Q1
Expected Unit Sales	50,000	45,000	48,000	143,000
Average price per unit	$35	$35	$35	$35
Expected Sales	$1,750,000	$1,575,000	$1,680,000	$5,005,000

Production Budget:

Interlek Inc. now wants to prepare a Production Budget. Their expected unit sales for the first four months of the year are:

January 50,000
February 45,000
March 48,000
April 52,000

Interlek Inc.'s policy is to have 35% of the next month's sales in ending inventory. On January 1, it is expected that 5,700 units will be on hand. Prepare a Production Budget for each month and for the quarter as a whole.

ANSWER

Interlek Inc.
Production Budget
For the period ending March 31, 2017

	January	February	March	Q1
Expected Unit Sales	50,000	45,000	48,000	143,000
+ Desired Ending Inventory	15750	16800	18200	18200
Total Needs	65750	61800	66200	161200
- Beginning Inventory	5,700	15750	16800	5,700
Units to be Produced	60050	46050	49400	155500

Direct Materials Purchases Budget:

Interlek Inc. uses 1 plastic case costing $1.25 each and 2 tiny speakers costing $3.50 each to make one speaker. Their policy is to hold 15% of the next month's production needs in ending inventory. Prepare the Direct Materials Purchases Budget for January and February for the plastic cases and tiny speakers.

For Plastic Cases:

For Tiny Speakers:

ANSWERS
For Plastic Cases:

Interlek Inc.
Direct Materials Purchases Budget
For the period ending March 31, 2017

	January	February
Units to be Produced	60,050	46,050
DM per unit	x 1	x 1
Production Needs	60,050	46,050
+ Desired Ending Inventory	6907.5	7410
Total Needs	66958	53460
- Beginning Inventory	9,008	6907.5
Quantity to be purchased	57950	46553
Cost per unit	x $1.25	x $1.25
Total Cost	$72,437.50	$58,190.63

For Tiny Speakers:

Interlek Inc.
Direct Materials Purchases Budget
For the period ending March 31, 2017

	January	February
Units to be Produced	60,050	46,050
DM per unit	x 2	x 2
Production Needs	120,100	92,100
+ Desired Ending Inventory	13815	14820
Total Needs	133915	106920
- Beginning Inventory	18,015	13815
Quantity to be purchased	115900	93105
Cost per unit	x $3.50	x $3.50
Total Cost	$405,650.00	$325,867.50

Financial Budgets

In the financial budgets, we want to know how much money the company will collect or must pay in a given period.

Cash Collections Budget:

This budget summarizes the cash that will be collected from sales in a given period. This includes cash sales and credit sales collections from previous months.

TIP always start with the most recent month.

Bounty Co. sells different types of paper to offices in Toronto. All of their sales are on account. On average, they expect to collect 20% in the month of purchase, 50% in the month after, and 25% will be collected in the second month after purchase. The following are their sales for the past 5 months:

May	$90,000
June	$126,000
July	$100,000
August	$87,000
September	$94,000

Prepare a cash collections budget for the months of August and September.

ANSWER

Bounty Co.
Cash Collections Budget
For the months of August and September

	August	September
September	----------	$18,800
August	$17,400	$43,500
July	$50,000	$25,000
June	$31,500	----------
Total	$98,900	$87,300

Cash Disbursements Budget:

This budget totals the payments that must be made during a given period. This is exclusive to payments for purchases of materials on account.

Interlek Inc. sells speakers. They purchase all of their direct materials on account. They have the habit of paying for 30% of their purchases in the month of purchase and the remaining 70% in the following month. Below are their total Direct Materials purchases for 5 months:

March	$367,000
April	$345,000
May	$370,000
June	$350,000
July	$360,000

Prepare a schedule of cash disbursements for the months of July and June.

ANSWER

Interlek Inc.
Cash Disbursements Budget
For the months of June and July

	June	July
July	----------	$108,000
June	$105,000	$245,000
May	$259,000	----------
Total	$364,000	$353,000

Chapter 9 – Review Questions

Question 1:

Sister Inc. manufactures ergonomic chairs. The chairs require 4 wooden legs costing $5.00 each and 1 seat costing $6.00 each. They have established a policy to keep 20% of the next months expected production needs in ending inventory. Prepare a purchases of Direct Materials Budget for the months of June and July.

	Expected Units to be Produced
June	200,000
July	240,000
August	260,000

For Wooden Legs:

For Seats:

ANSWERS

For Wooden Legs:

Sister Inc.
Direct Materials Purchases Budget
For the months of June and July

	June	July
Units to be Produced	200,000	240,000
DM per unit	x 4	x 4
Production Needs	800,000	960,000
+ Desired Ending Inventory	192,000	208,000
Total Needs	992,000	1,168,000
- Beginning Inventory	160,000	192,000
Quantity to be purchased	832,000	976,000
Cost per unit	x $5.00	x $5.00
Total Cost	$4,160,000	$4,880,000

For Seats

Sister Inc.
Direct Materials Purchases Budget
For the months of June and July

	June	July
Units to be Produced	200,000	240,000
DM per unit	x 1	x 1
Production Needs	200,000	240,000
+ Desired Ending Inventory	48,000	52,000
Total Needs	248,000	292,000
- Beginning Inventory	40,000	48,000
Quantity to be purchased	208,000	244,000
Cost per unit	x $6.00	x $6.00
Total Cost	$1,248,000	$1,464,000

Question 2:

Gateway Co. sells different types of monitors to offices in Montreal. 80% of their sales are on account. On average, they expect to collect 30% in the month of purchase, 60% in the month after, and 10% will be collected in the second month after purchase. Collections received in the second month after purchase are subject to a 3% late fee. The following are their sales for the past 5 months:

March	$120,000
April	$145,000
May	$200,000
June	$210,000
July	$165,000

Prepare a cash collections budget for the months of June and July

ANSWERS

Step 1: Calculate cash and credit sales

	Total Sales	Cash Sales	Credit Sales
March	$120,000	$24,000	$96,000
April	$145,000	$29,000	$116,000
May	$200,000	$40,000	$160,000
June	$210,000	$42,000	$168,000
July	$165,000	$33,000	$132,000

Step 2: Complete the Budget

Gateway Co.
Cash Collections Budget
For the months of June and July

	June	July
Cash Sales	$42,000	$33,000
July	----------	$39,600
June	$50,400	$100,800
May	$96,000	$16,480
April	$11,948	----------
Total	$200,348	$189,880

Chapter 10 – Standard Costing and Variance Analysis

What is Standard Costing?

Standard Costingis the practice of substituting an expected cost for an actual cost in the accounting records, and then periodically recording variances showing the difference between the expected and actual **costs**.

This method of costing means that even Direct Materials and Direct Labour are going to be adjusted at the end of the month, just as Overhead was applied and adjusted in chapter 5.

The trick to solving these problems is the AAASSS:

1	2	3
Actual Quantity/Hours x Actual Price	Actual Quantity/Hours x Standard Price	Standard Quantity/Hours x Standard Price

1 – 2 = Price Variance 2 – 3 = Usage Variance

Price Variance + Usage Variance = Total Variance

1 – 3 = Total Variance

A variance > 0 is unfavourable and is added to COGS
A variance < 0 is favourable and is subtracted from COGS

Formula Approach

	Direct Materials Variances	Direct Labour Variances
Price Variance	Price Variance = Actual Quantity (AQ) x (Actual Price (AP) - Standard Price (SP)) Price Variance = AQx(AP - SP)	Price Variance = Actual Hours (AH) x (Actual Price (AP) - Standard Price (SP)) Price Variance = AHx(AP - SP)
Usage Variance	Usage Variance = Standard Price (SP) x (Actual Quantity (AQ) - Standard Quantity (SQ)) Usage Variance = SPx(AQ-SQ)	Usage Variance = Standard Price (SP) x (Actual Hours (AH) - Standard Hours (SQ)) Usage Variance = SPx(AH-SQ)
Total Variance	Total Variance = Price Variance + Usage Variance Total Variance = (Actual Price(AP) x Actual Quantity(AQ)) - (Standard Price(SP) - Standard Quantity(SQ)) Total Variance = APxAQ = SPxSQ	

Calculating Direct Materials Variances Example

Baba Inc. produces plastic containers. Production of 300-gram containers has a standard unit quantity of 45 grams of plastic per container. During January, 150,000 containers were produced using 6,500,000 grams of plastic. The actual cost of plastic was $0.10 per gram and the standard price was $0.08 per gram.

1	2	3
Actual Quantity/Hours x Actual Price	Actual Quantity/Hours x Standard Price	Standard Quantity/Hours x Standard Price

ANSWER

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
6,500,000 grams * $0.10 = $650,000		6,500,000 grams * $0.08 = $520,000		SQ = Actual Production * Standard Rate = 45 grams * 150,000 containers = 6,750,000 6,750,000 * $0.08 = $540,000
$650,000 - $520,000 =	$130,000 unfavourable Price Variance	$520,000 - $540,000 =	-$20,000 favourable Usage Variance	
	Price Variance + Usage Variance = Total Variance $130,000 + (-$20,000) = $110,000 unfavourable			
	$650,000 - $540,000 = $110,000 unfavourable Total Variance			

Calculating Labour Variances Example

Baba Inc. produces plastic containers. Each container has a standard labour requirement of 0.02 hours. During the month of April, 300,000 containers were produced using 5,600 labour hours at $12.00. The standard wage rate is $11.50 per hour.

1	2	3
Actual Quantity/Hours x Actual Price	Actual Quantity/Hours x Standard Price	Standard Quantity/Hours x Standard Price

ANSWER

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
5,600 hours * $12 = $67,200		5,600 hours * $11.50 = $64,400		SQ = Actual Production * Standard Rate SQ = 0.02*300,000 = 6,000 Hours 6,000 hours * $11.50 = $69,000
$67,200 - $64,400 =	$2,800 unfavourable Price Variance	$64,400 - $69,000 =	-$4,600 favourable Usage Variance	
	Price Variance + Usage Variance = Total Variance $2,800 + (-$4,600) = - $1,800 favourable			
	$67,200 - $69,000 = -$1,800 favourable Total Variance			

Chapter 10 – Review Questions

Example 1
Rolo Inc. produces high quality leather shoes. The company uses standard costing and has set the following standards:

Leather (4 pieces @ $3) $12.00
Direct Labour (1.25 hours @ $14) $17.50
Total prime costs $29.50

During the year, Rolo produced 87,000 shoes. Actual leather purchased was 330,000 pieces at $3.05 per strip. There were no beginning or ending inventories of leather. Actual direct labour was 110,000 hours at $14.50 per hour.

a) Calculate the Direct Materials variances
b) Calculate the Direct Labour variances

ANSWER

a) Calculate the Direct Materials variances

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
330,000 pieces * $3.05 = $1,023,000		330,000 pieces * $3 = $990,000		SQ = Actual Production * Standard Rate SQ = 4*87,000 = 348,000 pieces 348,000 pieces * $3 = $1,044,000
$1,006,500 - $990,000 =	$16,500 unfavourable Price Variance	$990,000 - $1,044,000 =	-$54,000 favourable Usage Variance	
	Price Variance + Usage Variance = Total Variance $16,500 + (-$54,000) = - $37,500 favourable			
	$1,023,000 - $1,044,0000 = -$37,500 favourable Total Variance			

b) Calculate the Direct Labor variances

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
110,000 hours * $14.50 = $1,595,000		110,000 hours * $14.00 = $1,540,000		SQ = Actual Production * Standard Rate SQ = 1.25*87,000 = 108,750 hours 108,750 hours * $14.00 = $1,522,500
$1,595,000 - $1,540,000 =	$55,000 unfavourable Price Variance	$1,540,000 - $1,522,500 =	$17,500 unfavourable Usage Variance	
	Price Variance + Usage Variance = Total Variance $55,000 + $17,500 = $72,500 unfavourable			
	$1,595,000 - $1,522,500 = $72,500 unfavourable Total Variance			

Example 2

At the beginning of the year, Blumen Inc. had the following standard costs estimated:

Direct Material (4kg at $5)	$20.00
Direct Labour (1.5 hours at $11)	$16.50
Standard Prime Costs Per Unit	$36.50

The actual results for the year are:

Units Produced	135,000
Materials Purchased	580,000 @ 5.25
Materials Used	555,000
Direct Labour	198,000 @11.75

a) Calculate the Direct Materials variances
b) Calculate the Direct Labour variances

ANSWERS

a)

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
555,000*$5.25 = $2,913,750		555,000*$5 = $2,775,000		SQ = Actual Production * Standard Rate SQ = 4*135,000 = 540,000 kg 540,000 * $5 = $2,700,000
$2,913,750 - $2,775,000 = $138,750	$138,750 unfavourable Price Variance	$2,775,000 - $2,700,000 = $75,000	$75,000 Unfavourable Usage Variance	
	Price Variance + Usage Variance = Total Variance $138,750 + $75,000 = $213,750 Unfavourable			
	$2,913,750 - $2,700,000 = $213,750 Unfavourable			

b)

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
198,000*$11.75 = $2,326,500		198,000*$11 = $2,775,000		SQ = Actual Production * Standard Rate SQ = 1.5*135,000 = 202,500 Hours 202,500*$11 = $2,227,500
$2,326,500 - $2,178,000 = $148,500	$148,500 unfavourable Price Variance	$2,178,000 - $2,227,500 =	-$49,500 Favourable Efficiency Variance	
	Price Variance + Usage Variance = Total Variance $148,500 + (-$49,500) = $99,000 unfavourable			
	$2,326,500 - $2,227,500 = $99,000 Unfavourable Total Variance			

Chapter 11 – Overhead Variance and Flexible Budgets

Static Budgets vs Flexible Budgets

Static Budgets: these are budgets prepared at a specific level of production. Using these budgets to compare actual performance to budgeted performance is not recommended.

Flexible Budgets: these budgets compare actual performance to budgeted performance for the same level activity.

There are two types of flexible budgets:

1. Before the fact: these budgets are prepared for a range of production levels

Production Costs	VC per Unit	Range of Production (units)		
Units produced		1,000	1,200	1,400
Variable:				
Direct mat.	$4.00	$4,000	$4,800	$5,600
Direct labour	$1.20	$1,200	$1,440	$1,680
Variable overhead:				
Maintenance	$0.45	$450	$540	$630
Power	$0.15	$150	$180	$210
Total variable costs	$5.80	$5,800	$6,960	$8,120
Fixed overhead:				
Janitorial Expenses		$1,200	$1,200	$1,200
Depreciation		$600	$600	$600
Total fixed costs		$1,800	$1,800	$1,800
Total production costs		$7,600	$8,760	$9,920

2. After the fact: these budgets are prepared at the same production level as the actual production

Production Costs	VC per Unit	Budgeted Costs
Units produced		1,200
Variable:		
Direct material cost	$4.00	$4,800
Direct labour cost	$1.20	$1,440
Variable overhead:		
Maintenance	$0.45	$540
Power	$0.15	$180
Total variable costs	$5.80	$6,960
Fixed overhead:		
Janitorial Expenses		$1,200
Depreciation		$600
Total fixed costs		1800
Total production costs		$8,760

Before the fact budget example

Blutex Co. had the following budgeted amounts:

Variable costs:		
Direct Materials	3 kg @ $0.7 per kg	
Direct Labour	0.5 hr @ $14 per hour	
Variable Overhead	0.5 hr @ $2.20 per hour	
Fixed Overhead:		
Materials handling		$6,200
Depreciation		$2,600

Prepare a flexible budget for 2,000, 4,000 and 5,000 units

ANSWER

Step 1: Calculate the per unit costs

		Per unit costs
Direct Materials	3 kg x $0.70 =	$2.10
Direct Labour	0.5 hr x $14 =	$7.00
Variable Overhead	0.5 hr x $2.20 =	$1.10

Step 2: Prepare the Budget

Production Costs	VC per Unit	Range of Production (units)		
Units produced		2,000	4,000	5,000
Variable Costs:				
Direct mat.	$2.10	$4,200	$8,400	$10,500
Direct labour	$7.00	$14,000	$28,000	$35,000
Variable overhead	$1.10	$2,200	$4,400	$5,500
Total variable costs	$10.20	$20,400	$40,800	$51,000
Fixed overhead:				
Materials handling		$6,200	$6,200	$6,200
Depreciation		$2,600	$2,600	$2,600
Total fixed costs		$8,800	$8,800	$8,800
Total production costs		$29,200	$49,600	$59,800

After the fact budget example

Blutex Co. had the following budgeted amounts:

Variable costs:	
Direct Materials	3 kg @ $0.7 per kg
Direct Labour	0.5 hr @ $14 per hour
Variable Overhead	0.5 hr @ $2.20 per hour
Fixed Overhead:	
Materials handling	$6,200
Depreciation	$2,600

Blutex Co. produced 2,400 units and had the following actual costs:

Variable costs:	
Direct Materials	$5,000
Direct Labour	$17,000
Variable Overhead	$3,000
Fixed Overhead:	
Materials handling	$6,200
Depreciation	$2,600

Prepare a variable budget and calculate the variances.

ANSWER

Step 1: Calculate the per unit budgeted costs

		Per unit costs
Direct Materials	3 kg x $0.70 =	$2.10
Direct Labour	0.5 hr x $14 =	$7.00
Variable Overhead	0.5 hr x $2.20 =	$1.10

Step 2: Prepare the Budget

Production Costs	VC per Unit	Actual Costs	Budgeted Costs
Units produced		2,400	2,400
Variable:			
Direct material cost	$2.10	$5,000	$5,040
Direct labour cost	$7.00	$17,000	$16,800
Variable overhead	$1.10	$3,000	$2,640
Total variable costs	$10.20	$25,000	$24,480
Fixed overhead:			
Materials handling		$6,200	$6,200
Depreciation		$2,600	$2,600
Total fixed costs		$8,800	$8,800
Total production costs		$33,800	$33,280

Variable and Fixed Overhead Variance:

Similar to direct materials and direct labour, it is important to also analyze overhead variances. Be aware, the method looks similar but has unique differences.

Variable Overhead Variance Analysis:

Columnar Approach:

1	2	3
Actual VOH	Budgeted VOH	Applied VOH
Actual VOHR x Actual Hours	Standard VOHR x Actual Hours	Standard VOHR x Standard Hou

OR Given

1 – 3 = Spending Variance 2 – 3 = Efficiency Variance

Spending Variance + Efficiency Variance = Total Variance

1 – 3 = Total Variance

Formula Approach:

Variable Overhead Spending Variance = (AVOR – SVOR)AH

AVOR = Actual Variable Overhead / Actual Hours

Variable Overhead Efficiency Variance = (AH – SH)SVOR

Total Variable Overhead Variance = Spending Variance + Efficiency Variance

Total Variable Overhead Variance = Actual VOH – Applied VOH = Actual VOH – SVOR*SH

Variable Overhead Variance Analysis Example

Blutex Co. had the following standard unit costs:

		Standard Unit Costs
Direct Materials	3 kg @ $0.7 per kg	$2.10
Direct Labour	0.5 hr @ $14 per hour	$7.00
Variable Overhead	0.5 hr @ $2.20 per hour	$1.10
Fixed Overhead	0.5 hr @ $4 per hour*	$2.00
	Standard Unit Cost	$12.20

* The Fixed OVH Rate is based on a budgeted fixed overhead of $12,000 and an expected activity level of 3,000 Direct Labour hours

During the year, the following actual results were recorded:

Units produced	7,000 units
Direct Materials	$14,500
Direct Labour (3,600 hours)	$50,000
Variable Overhead	$8,000
Fixed Overhead	$13,500

Calculate the Variable Overhead spending and efficiency variances

ANSWER

1		2		3
Actual VOH		Budgeted VOH		Applied VOH
Actual VOHR x Actual Hours OR Given		Standard VOHR x Actual Hours		Standard VOHR x Standard Hours
				Step 1: Calculate Standard hours
				SH = Actual Units Produced * Standard hours for production
				SH = 7,000 x 0.5 = 3,500 Hours
				Step 2: Calculate Applied VOH
		$2.20 * 3,600 =		$2.20 * 3,500 =
$8,000		$7,920		$7,700
$8,000 - $7,920=	$80 Unfavourable Spending Variance	$7,920 - $7,700 =	$220 Unfavourable Efficiency Variance	
	Spending Variance + Efficiency Variance = Total Variance			
	$80 + $220 = $300 Unfavourable Total Variance			
	1 – 3 = Total Variance			
	$8,000 - $7,700 = $300 Unfavourable Total Variance			

Fixed Overhead Variance Example

Columnar Approach:

1	2	3
Actual FOH Actual FOH Rate x Actual Hours OR Given	Budgeted FOH Standard FOHR x Budgeted Hours (at full/practical production capacity) OR Given	Applied FOH Standard FOHR x Standard Hours (at actual production capacity)

1 – 3 = Spending Variance

2 – 3 = Volume Variance

Spending Variance + Volume Variance = Total Variance

1 – 3 = Total Variance

Formula Approach:

Fixed Overhead Spending Variance = Actual Fixed Overhead – Budgeted Fixed Overhead
*Note: Budgeted Fixed Overhead is always measured at practical capacity. Practical capacity is the expected level the company targets to produce from the beginning of the year.

Fixed Overhead Volume Variance = BFOH – Applied Fixed Overhead = BFOH – (SH*SFOR)
*Note: SH is calculated by finding the standard hours required at the actual production capacity

Example
Blutex Co. had the following standard unit costs:

		Standard Unit Costs
Direct Materials	3 kg @ $0.7 per kg	$2.10
Direct Labour	0.5 hr @ $14 per hour	$7.00
Variable Overhead	0.5 hr @ $2.20 per hour	$1.10
Fixed Overhead	0.5 hr @ $4 per hour*	$2.00
	Standard Unit Cost	$12.20

* The Fixed OVH Rate is based on a budgeted fixed overhead of $12,000 and an expected activity level of 3,000 Direct Labour hours

During the year, the following actual results were recorded:

Units produced	7,000 units
Direct Materials	$14,500
Direct Labour (3,600 hours)	$50,000
Variable Overhead	$8,000
Fixed Overhead	$13,500

Calculate the Fixed Overhead spending and volume variances.

(Space to work on previous question)

ANSWER

1		2		3
Actual FOH		Budgeted FOH		Applied FOH
Given		Standard FOHR x Budgeted Hours (at full/practical production capacity) OR Given		Standard FOHR x Standard Hours (at actual production capacity)
				Step 1: Calculate Standard hours
				SH = Actual Units Produced * Standard hours for production
				SH = 7,000 x 0.5 = 3,500 Hours
				Step 2: Calculate Applied FOH
		$4 * 3,000 =		$4 * 3,500 =
$13,500		$12,000		$14,000
$13,500 - $12,000 =	$1,500 Unfavourable Spending Variance	$12,000 - $14,000 =	-$2,000 Favourable Volume Variance	
	Spending Variance + Volume Variance = Total Variance			
	$1,500 + (-$2,000) = -$500 Favorable Total Variance			
	1 – 3 = Total Variance			
	$13,500 - $14,000 = -$500 Favorable Total Variance			

Chapter 11 – Review Questions

Fixed Overhead Variance Example:

Double A had the following information:

Standard Fixed Overhead Rate	$4
Actual Fixed Overhead Rate	$4.25
Actual Direct Labour Hours	56,200
Actual Production in units	14,000
Standard Hours allowed for actual units produced	56,000
Standard Hours expected for the budgeted units to be produced	59,000

Calculate the fixed overhead spending and volume variances.

ANSWER:

1		2		3
Actual FOH		Budgeted FOH		Applied FOH
Actual FOHR x Actual Hours OR Given		Standard FOHR x Budgeted Hours (at full/practical production capacity) OR Given		Standard FOHR x Standard Hours (at actual production capacity)
$4.25*56,200 =		$4*59,000 =		$4*56,000 =
$238,850		$236,000		$224,000

$238,850 - $236,000 =	$2,850Unfavourable Spending Variance	$236,000 - $224,000 =	$12,000 Unfavourable Volume Variance	

	Spending Variance + Volume Variance = Total Variance	
	$2,850 + $12,000 = $14,850Unfavourable Total Variance	
	1 – 3 = Total Variance	
	$238,850 - $224,000 = $14,850Unfavourable Total Variance	

<u>Overhead Variance Example:</u>

Out and In Co. budgeted to produce 600,000 monitors next year. Using direct labour hours to assign overhead, they expect that each monitor requires 0.75 standard hours of direct labour. The budgeted variable overhead was $945,500 and the budgeted fixed overhead was $834,000.

Actual Production in units	594,000
Actual DL hours	446,000
Actual Variable Overhead	$928,000
Actual Fixed Overhead	$835,000

1. Calculate the Standard Fixed Overhead and Variable Overhead Rates
2. Calculate the Variable Overhead Spending, Efficiency and Total Variances
3. Calculate the Fixed Overhead Spending, Volume and Total Variances

(SPACE TO WORK ON PREVIOUS QUESTION)

ANSWERS

Part 1: Calculate the Standard Fixed Overhead and Variable Overhead Rates

SFOHR = Budgeted FOH / Budgeted DL Hours
SFOHR = $834,000 / (600,000*0.75)
SFOHR = $834,000 / 450,000
SFOHR = $1.85

VOHR = Budgeted VOH / Budgeted DL Hours
VOHR = $945,500 / 450,000
VOHR = $2.10

Part 2: Calculate the Variable Overhead Spending, Efficiency and Total Variances

1		2		3
Actual VOH		Budgeted VOH		Applied VOH
Actual VOHR x Actual Hours OR Given		Standard VOHR x Actual Hours		Standard VOHR x Standard Hours
				Step 1: Calculate Standard hours
				SH = Actual Units Produced * Standard hours for production
				SH = 594,000*0.75 = 445,000
				Step 2: Calculate Applied VOH
		$2.10 * 446,000 =		$2.10 * 445,000 =
$928,000		$936,600		$934,500
$928,000 - $936,000 =	-$8,600 Favourable Spending Variance	$936,600 - $934,500 =	$2,100 Unfavourable Efficiency Variance	
	Spending Variance + Efficiency Variance = Total Variance			
	-$8,600 + $2,100 = -$6,500 Favourable Total Variance			
	1 – 3 = Total Variance			
	$928,000 - $934,000 = -$6,500 Favourable Total Variance			

Part 3: Calculate the Fixed Overhead Spending, Volume and Total Variances

1		2		3
Actual FOH		Budgeted FOH		Applied FOH
Actual FOHR x Actual Hours OR Given		Standard FOHR x Budgeted Hours (at full/practical production capacity) OR Given		Standard FOHR x Standard Hours (at actual production capacity)
				Step 1: Calculate Standard hours
				SH = Actual Units Produced * Standard hours for production
				SH = 594,000*0.75 = 445,000
				Step 2: Calculate Applied FOH
				$1.85*445,000 =
$835,000		$834,000		$823,250
$835,000 - $834,000 =	$1,000 Unfavourable Spending Variance	$834,000 - $823,250 =	$11,000 Unfavourable Volume Variance	
	Spending Variance + Volume Variance = Total Variance			
	$1,000 + $10,750 = $11,750 Unfavourable Total Variance			
	1 – 3 = Total Variance			
	$835,000 - $823,250 = $11,750 Unfavourable Total Variance			

Performance Report Example:

Gateway Co. had the following budgeted amounts:

Variable Costs:	
Direct Materials	30 kg @ $1.3 per kg
Direct Labour	5 hr @ $15 per hour
Variable Overhead	4 hr @ $4.00 per hour
Fixed Overhead:	
Materials handling	$15,000
Depreciation	$22,500

Gateway Co. produced 5,650 units and had the following actual costs:

Variable costs:	
Direct Materials	$217,500
Direct Labour	$425,250
Variable Overhead	$90,000
Fixed Overhead:	
Materials handling	$14,500
Depreciation	$24,500

Required: Prepare a variable budget and calculate the variances.

Answer

Step 1: Calculate the per unit budgeted costs

		Per unit costs
Direct Materials	30 kg x $1.3 =	$39.00
Direct Labour	5 hr x $15 =	$75.00
Variable Overhead	4 hr x $4.00 =	$16.00

Step 2: Prepare the Performance Report

Production Costs	VC per Unit	Actual Costs	Budgeted Costs	Variance	
Units produced		5,650	5,650		
Variable:					
Direct material cost	$39.00	$217,500	$220,350	($2,850)	Favourable
Direct labour cost	$75.00	$425,250	$423,750	$1,500	Unfavourable
Variable overhead	$16.00	$90,000	$90,400	($400)	Favourable
Total variable costs	$130.00	$732,750	$734,500	($1,750)	Favourable
Fixed overhead:					
Materials handling		$14,500	$15,000	($500)	Favourable
Depreciation		$24,500	$22,500	$2,000	Unfavourable
Total fixed costs		$39,000	$37,500	$1,500	Unfavourable
Total production costs		$771,750	$772,000	($250)	Favourable

Chapter 13 – Short Run Decision Making

This chapter is about using accounting to make a decision between two options. The best way to make any financial decision between two options is to tally up the expected costs or benefits of each option and choose the one with the lowest cost or benefit… right?

Everyone makes decisions like these on a daily basis, but have probably never written it out. The key concept used to make decisions is **relevant costs.** When making a decisions between two options, I only compare the differences.

For example, I want to decide if I should live downtown during the semester or stay at home and commute. My costs for moving downtown would be: rent & utilities $1,400, Food $400, Entertainment $200, metro pass $150. My costs for staying with my parents and commuting would be $200 on Food, $200 on entertainment and $150 on my metro pass.

We will be using a table to compare these two options, all we need to do is make a list of the costs for each.

Cost	Moving Out	Staying	Difference
Rent & Utilities	($1,400)	$0	($1,400)
Food	($400)	($200)	($200)
Total	($1,800)	($200)	($1,600)

Notice that entertainment and metro pass costs are not included in the calculations, this is because they are **not relevant** to my decision. If I am paying the same amount regardless of the option, then it does not matter which one I choose.

As you can see, if I was making this decision entirely based on finances, my decision would be to stay with my parents. It is $1,600 cheaper per month to stay at home than to move out.
This concept can be applied to many decisions, such as:

- To Make a component in-house or Buy it from someone else
- To keep or drop a product line
- To further process a product or sell it as is
- To accept a special order at less than the usual price

Example:
The managerial accountant needs to decide if they will make or buy the processor for their smartphone. The part costs $18 to buy. To manufacture 10,000 parts, the following costs apply:

Materials	$60,000
Labour	$80,000
Overhead	$80,000
Total	$220,000

The overhead is fixed and will continue to be paid regardless of the decision made.

Cost	Make	Buy	Difference
Materials	($60,000)	$0	($60,000)
Labour	($80,000)	$0	($80,000)
Purchase Cost	$0	($180,000)	$180,000
Total	($140,000)	($180,000)	$40,000

Since it would cost more to buy the parts, he will continue to make the part in-house.

What if the overhead reduced by $50,000 if the company bought the part?

Cost	Make	Buy	Difference
Materials	($60,000)	$0	($60,000)
Labour	($80,000)	$0	($80,000)
Overhead	($80,000)	($30,000)	($50,000)
Purchase Cost	$0	($180,000)	$180,000
Total	($220,000)	($210,000)	($10,000)

Now it is more profitable to buy the part. Notice that overhead is now a relevant cost, since it depends on our choice.

Extra Practice:

Derrick approaches a local shoe manufacturer and offers them to purchase 1,000 of their newest shoes for $30 each. The shoes cost $22 to make and the normal selling price is $80 each. Derrick promises he will not tell anyone about the deal and that it will not affect any of the other customers. The shoe company plans to produce 20,000 units this year, but they have the capacity to produce 25,000 shoes.

Should they accept Derrick's offer?

Answer:

	Accept	Reject	Difference
Revenue	$30,000	$0	$30,000
Cost to manufacture	($22,000)	$0	($22,000)
Total	$8,000	$0	$8,000

Mock Exam

Question 1

ABC Company has the following information about the utilities costs for last year:

Month	Machine Hours	Utilities
January	2,800	$16,100
February	2,600	$15,500
March	2,880	$16,500
April	2,760	$16,100
May	2,840	$16,350
June	2,320	$14,300
July	1,840	$12,400
August	1,640	$11,560
September	2,920	$16,700
October	3,400	$18,600
November	3,280	$18,100
December	2,960	$16,850

Required:

Using the high-low method, predict what the utilities cost would be for a month in which the company uses 2,500 machine hours.

Answer:
Step 1: Find the high and low points
*Always look at output!

	Month	Machine Hours	Utilities
High:	October	3,400	$18,600
Low:	August	1,640	$11,560

Step 2: Calculate the variable costs per unit
VC per unit = (High Cost - Low Cost)/(High Hours - Low Hours)
VC per unit = $4 per hour

Step 3: Calculate Fixed Costs
TC = VC*(Machine Hours) + FC
Plug in High Point:
$18,600 = $4*(3,400) + FC
FC = $5,000

Cost Formula:
TC = $4*(Machine Hours) + $5,000

Test: Plug in the low point to see if it gives you the actual TC

$11,560 = $4*(1,640) + $5,000
$11,560 = $11,560

Now to answer the question, how much would it cost for 2,500 hours?

TC = $4*(2,500) + $5,000
TC = $15,000

Question 2:

ABC Company's selected data for the month of May 2008 are presented below:

Beginning Work-In-Process Inventory	$14,000
Ending Work-in-Process Inventory	$10,000
Beginning Direct Materials Inventory	$8,000
Ending Direct Materials Inventory	$14,000
Selling Expenses	$28,000
Direct Materials Purchased	$24,000
Sales	$198,000
Direct labor	$40,000
Manufacturing Overhead	$46,000
Administrative Expenses	$30,000
Beginning Finished Goods Inventory	$24,000
Ending Finished Goods Inventory	$32,000

Required:

Compute the following costs:

1. Direct Materials Used
2. Cost of Goods Manufactured
3. Cost of Goods Sold

Answer:

1. Direct Materials Used

Beginning Direct Materials Inventory	$8,000
Direct Materials Purchased	$24,000
Ending Direct Materials Inventory	$(14,000)
Direct Materials used.	$18,000

2. Cost of Goods Manufactured

Direct Materials used	$18,000
Direct labor	$40,000
Manufacturing Overhead	$46,000
Total Manufacturing Costs	$104,000

Beginning Work-In-Process Inventory	$14,000
Total Manufacturing Costs	$104,000
Ending Work-in-Process Inventory	$(10,000)
Costs of Goods Manufactured	$108,000

3. Cost of Goods Sold

Beginning Finished Goods Inventory	$24,000
Costs of Goods Manufactured	$108,000
Ending Finished Goods Inventory	$(32,000)
Costs of Goods Sold	$100,000

Question 3:

ABC Company projected operating income for the next fiscal year as follows:

	Total	Per Unit
Sales	$200,000	$20
Less: Variable Costs	$120,000	$12
Contribution Margin	$80,000	$8
Less: Fixed Costs	$64,000	
Operating Income	$16,000	

Required:

1. Compute the breakeven points in units
2. Compute the number of units that must be sold to earn an operating income of $30,000
3. Compute the contribution margin ratio
4. Compute the increase in operating income if sales revenue increases by $25,000 more than projected
5. Compute the number of units that must be sold for the Company to earn an operating income equal to 20% of sales revenue
6. For the projected level of sales, compute the margin of safety in dollars

Answer:

1. Compute the breakeven points in units

   BEP = FC/CM …. BEP = 8000

2. Compute the number of units that must be sold to earn an operating income of $30,000

   Target Unit Sales = (FC + OI) / CM …. Target Unit Sales = 11,750

3. Compute the contribution margin ratio

   CM Ratio = CM/Sales …. CM ratio = 40%

4. Compute the increase in operating income if sales revenue increases by $25,000 more than projected

   DOL = CM/Sales …. DOL = 5
   % Increase in OI = % increase in sales x DOL
   % increase in Sales = ($25,000/$200,000) = 12.50%
   & Increase in OI = 62.50%

5. Compute the number of units that must be sold for the Company to earn an operating income equal to 20% of sales revenue

   Target Income = 20% x $200,000 = (40,000 + 64,000) / $8 = 13,000

6. For the projected level of sales, compute the margin of safety in dollars

Step 1: Calculate BEP in Sales

We found BEP in units = 8,000
BEP Sales = 8,000x$20
BEP Sales = $160,000

Step 2: Calculate Margin of Safety

Margin of Safety = Sales - BEP Sales
Margin of Safety = $200,000 - $160,000
Margin of Safety = $40,000

Question 4:

During January, ABC Company worked on two jobs. Data related to these two jobs are as follows:

	Job 1	Job 2
Units in each order	50	100
Units sold	50	-
Materials requisitioned	$1,240	$985
Direct labor hours	410	583
Direct labor costs	$6,150	$8,745

Overhead rate is assigned on the basis of direct labor hours at the rate of $12 per direct labour hour.

During January, Job 1 was completed and transferred to finished goods. Job 2 was the only unfinished job at the end of the month.

Required:

1. Compute the per unit cost of Job 1.
2. Compute the balance in the Work-in-Process account on January 31.
3. Compute the selling price of Job 1 if it was sold at cost + 60%.

Answers:

1. Compute the per unit cost of Job 1.

Job Costs:	
Materials requisitioned	$1,240
Direct labor costs	$6,150
Overhead ($12x410)	$4,920
Total Job Costs	$12,310

Number of units	50
Cost per unit	$246.20

2. Compute the balance in the Work-in-Process account on January 31.

Calculate the cost of Job 2 (since it is the only job not finished)

Job Costs:	
Materials requisitioned	$985
Direct labor costs	$8,745
Overhead ($12x583)	$6,996
Total Job Costs	$16,726

Balance in Work in Process is $16,726

3. Compute the selling price of Job 1 if it was sold at cost + 60%.

Selling price = Cost x (1+Markup)

Selling price = $19,696

Question 5:

Print Co. produces two keyboards - deluxe gaming and business. Below are their overhead costs and corresponding activities.

Activity Name	Activity Driver	Activity Cost	Deluxe Gaming	Business
Assembly	Assembly Hours	$6,000,000	6,600	3,400
Machining	Machine Hours	$7,500,000	150,000	100,000
Packaging	# of orders Packaged	$800,000	220,000	180,000

Required:

1. Calculate the Activity Rates for each Activity
2. Calculate the consumption ratios for each activity
3. Calculate the total cost per unit of the Deluxe Gaming keyboards if they produced 10,000 units

Answer:

1. Calculate the Activity Rates for each Activity

Activity Name	Total Activity Cost	Total Activity Level	Activity Rate
Assembly	$6,000,000	10,000	$600
Machining	$7,500,000	250,000	$30
Packaging	$800,000	400,000	$2

2. Calculate the consumption ratios for each activity

Activity Name	Total Activity	Deluxe Gaming Consumption Ratios	Business Consumption Ratios
Assembly	10,000	66%	34%
Machining	250,000	60%	40%
Packaging	400,000	55%	45%

3. Calculate the total cost per unit of the Deluxe Gaming keyboards if they produced

Using Activity Rates

Activity Name	Activity Rate	Deluxe Gaming Activity Level	Cost
Assembly	$600	6,600	$3,960,000
Machining	$30	150,000	$4,500,000
Packaging	$2	220,000	$440,000
		Total	$8,900,000

Using Consumption Ratios

Activity Name	Total Activity Cost	Deluxe Gaming Consumption Ratios	Cost
Assembly	$6,000,000	66%	3,960,000
Machining	$7,500,000	60%	4,500,000
Packaging	$800,000	55%	440,000
		Total	$8,900,000

Unit Cost = Total Cost / Total Units = $890

Question 6:

Boss Co. sells different types of paper to offices in Toronto. 80% of their sales are on account. On average, they expect to collect 30% in the month of purchase, 60% in the month after, and 10% will be collected in the second month after purchase. Collections received in the second month after purchase are subject to a 3% late fee. The following are their sales for the past 5 months:

March	$300,000
April	$350,000
May	$365,000
June	$380,000
July	$400,000

Required:

Prepare a cash collections budget for the months of June and July.

Answer:

Step 1: Calculate cash and credit sales:

	Total Sales	Cash Sales	Credit Sales
March	$300,000	$60,000	$240,000
April	$350,000	$70,000	$280,000
May	$365,000	$73,000	$292,000
June	$380,000	$76,000	$304,000
July	$400,000	$80,000	$320,000

Boss Co.
Cash Collections Budget
For the months of June and July

	June	July
Cash Sales	$76,000	$80,000
July	----------	$96,000
June	$91,200	$182,400
May	$175,200	$30,076
April	$28,840	----------
Total	$371,240	$388,476

Question 7:

Fancy Inc. produces high quality suits. The company uses standard costing and has set the following standards:

Fabric (4 meters @ $30)	$120.00
Direct Labour (6 hours @ $40)	$240.00
Total prime costs	$360.00

During the year, Fancy produced 10,000 suits. Actual fabric used was 38,000 meters at $31.50 per meter. There were no beginning or ending inventories of lfabric. Actual direct labour was 63,400 hours at $38.50 per hour.

Required:

1. Calculate the Direct Materials variances
2. Calculate the Direct Labour variances

Answer:

1. Calculate the Direct Materials variances

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
38,000 meters * $31.50 = $1,197,000		38,000 meters * $30 = $1,114,000		SQ = Actual Production * Standard Rate SQ = 4*10,000 = 40,000 meters 40,000 meters * $30 = $1,200,000
$1,197,000 - $1,114,000 =	$83,000 unfavourable Price Variance	$1,114,000 - $1,200,000 =	-$86,000 favourable Usage Variance	
	Price Variance + Usage Variance = Total Variance $83,000 + (-$86,000) = -$3,000 favourable Total Variance			
	$1,197,000 - $1,200,000 = -$3,000 favourable Total Variance			

2. Calculate the Direct Labour variances

1		2		3
Actual Quantity/Hours x Actual Price		Actual Quantity/Hours x Standard Price		Standard Quantity/Hours x Standard Price
63,400 hours * $38.50 = $2,440,900		63,400 hours * $40.00 = $2,536,000		SQ = Actual Production * Standard Rate SQ = 6*10,000 = 60,000 hours 60,000 hours * $40.00 = $2,400,000
$2,440,900 - $2,536,000 =	-$95,100 favourable Price Variance	$2,536,000 - $2,400,000 =	$136,000 unfavourable Usage Variance	
	Price Variance + Usage Variance = Total Variance -$95,100 + $136,000 = $40,900 unfavourable			
	$2,440,900 - $2,400,000 = $40,900 Unfavourable Total Variance			

Question 8:

Tissue Co. had the following standard unit costs:

		Standard Unit Costs
Direct Materials	0.5 kg @ $1.50 per kg	$0.75
Direct Labour	0.15 hr @ $14 per hour	$0.60
Variable Overhead	0.15 hr @ $6.65 per hour	$1.00
Fixed Overhead	0.15 hr @ $4 per hour*	$0.60
	Standard Unit Cost	$2.95

* The Fixed OVH Rate is based on a budgeted fixed overhead of $12,000 and an expected activity level of 3,000 Direct Labour hours

During the year, the following actual results were recorded:

Units produced	80,000
Direct Materials	$56,700
Direct Labour (12,100 hours)	$165,000
Variable Overhead	$77,700
Fixed Overhead	$51,000

Required:

1. Calculate the Variable Overhead spending and efficiency variances
2. Calculate the Fixed Overhead spending and efficiency variances

Answer:

1. Calculate the Variable Overhead spending and efficiency variances

1		2		3
Actual VOH		Budgeted VOH		Applied VOH
Actual VOHR x Actual Hours OR Given		Standard VOHR x Actual Hours		Standard VOHR x Standard Hours
				Step 1: Calculate Standard hours
				SH = Actual Units Produced * Standard hours for production
				SH = 80,000 x 0.15 = 12,000 Hours
				Step 2: Calculate Applied VOH
		$6.65 * 12,100 =		$6.65 * 12,000 =
$77,700		$80,465		$79,800
$77,700 - $80,465 =	-$2,765 Favourable Spending Variance	$80,465 - $79,800 =	$665 Unfavourable Efficiency Variance	
	Spending Variance + Efficiency Variance = Total Variance			
	-$2,765 + $665 = -$2,100 Favourable Total Variance			
	1 – 3 = Total Variance			
	$77,700 - $79,800 = -$2,100 Favourable Total Variance			

2. Calculate the Fixed Overhead spending and efficiency variances

1		2		3
Actual FOH		Budgeted FOH		Applied FOH
Actual FOHR x Actual Hours OR Given		Standard FOHR x Budgeted Hours (at full/practical production capactiy) OR Given		Standard FOHR x Standard Hours (at actual production capacity)
				Step 1: Calculate Standard hours
				SH = Actual Units Produced * Standard hours for production
				SH = 80,000 x 0.15 = 12,000 Hours
				Step 2: Calculate Applied FOH
				$4 * 12,000 =
$51,000		$54,000		$48,000
$51,000 - $54,000 =	-$3,000 Favourable Spending Variance	$54,000 - $48,000 =	$6,000 Unfavourable Volume Variance	
	Spending Variance + Volume Variance = Total Variance			
	-$3,000 + $6,000 = $3,000 Unfavourable Total Variance			
	1 – 3 = Total Variance			
	$51,000 - $48,000 = $3,000 Unfavourable Total Variance			

Question 9:

Mays Inc. produces the best potatoes in Idaho, but not every potato they grow is up to their standard. They are considering a plan to take the sub-quality potatoes and make them into chips. They currently sell a kg of sub-quality potatoes for $0.50. They can sell a bag of chips for $1.00.

If they decide to make potato chips, they would incur the following annual costs:

Materials (bags and boxes)	$2,000
Labour	$4,000

Required:
It would not cost them anything extra to continue selling the potatoes as-is. If they have 10,000 kgs of sub-quality potatoes available per year and they sell 9,000 bags of chips. Which option should they take?

Answer:

	As-is	Chips	Difference
Revenue	$5,000	$9,000	($4,000)
Materials	$0	($2,000)	$2,000
Labour	$0	($4,000)	$4,000
Total	$5,000	$3,000	$2,000