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# Tipperary BATAI

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## Accounting Revision Seminar

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**Saturday  
27.04.2024**

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## Production Budget

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## Question 9

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Presented by  
Jason Ryan

YouTube <https://www.youtube.com/jasonryanteach>

Twitter @JasonRyanTeach

Website [mrryanaccounting.weebly.com](http://mrryanaccounting.weebly.com)

[mrryanjcb.weebly.com](http://mrryanjcb.weebly.com)

[businesshfc.weebly.com](http://businesshfc.weebly.com)

**PAST TOPIC - QUESTION 9**

	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Cash Budget	2023			Yes				Yes	Yes		Yes	Yes		Yes	Yes	
Production Budgets		Yes			Yes		Yes			Yes			Yes			Yes
Flexible Budgets			Yes			Yes								Yes		

**Additional Resources**

Remember it is important to complete questions for

1. Production budget and
2. Cash budget

Please click the link to get access to additional resource

[Theory](#) – Flexible budget

[Past exam questions](#) – production budget

[Theory](#) – Production budgets

[Past exam question](#) – Cash Budgets

[Theory](#) – Cash Budgets

**2020 – Question 9 – Houghton Ltd**

**PART A**

Part A is asking you to calculate

- (i) Separate production overheads to fixed and variable elements
- (ii) Separate other overheads to fixed and variable elements
- (iii) Prepare a flexible budget for 90% activity level using marginal costing principles and show the contribution

<b>Marginal Costing Principles</b>				
1	Sales		x	Calculation as per question
	<b>Less Variable Costs</b>			Calculation as per question
2	Production Overheads	x		Calculation as per part (i)
3	Other Overhead	(+) x		Calculation as per part (ii)
4	Direct materials	(+) x		Need to calculate (Knowledge)
5	Direct wages	(+) x	(x)	Need to calculate (Knowledge)
	<b>Contribution</b>		x	Sales – Variable Costs
	<b>Fixed Costs</b>			
6	Administration	x		Given in question
7	Production Overheads	(+) x		Calculation as per part (i)
8	Other Overheads	(+) x	(x)	Calculation as per part (ii)
	<b>Profit</b>		x	Contribution – Fixed Costs

**Separate production overheads to fixed and variable elements**

There are two parts to this question

1. You need to find the variable costs and
2. You need to find the fixed costs

**Variable costs**

To calculate the variable costs

1. use the template below
2. And to get the variable cost per unit figure divide the € by the units

**Exam Tip**  
When calculate the variable cost always use this layout

	Units	€
High	x	x
Low	(-) x	(-) x
Difference	x	x

€
Units

€0.00	Variable Cost per Unit
-------	------------------------

**Step 1**

The figures that we use from the question will be

Output Levels	55%	75%	95%
Units	27,500	37,500	47,500
Costs	€	€	€
Production overheads	129,000	173,000	217,000

*Taken from the question*

We use the High / Low method to calculate the Variable Costs Per Unit

1. We take the high figure for the units and take away the low figure and take the high figure for the costs and take away the low figure.
2. From the figures we calculate in 1 above we divide the cost by the units to get the Variable Cost Per Unit

	Units	€
High	47,500	217,000
Low	(-) 27,500	(-) 129,000
Difference	20,000	88,000

20,000
88,000

€4.40	Variable Cost per Unit
-------	------------------------

### Fixed Costs

To calculate the variable costs

1. use the template below
2. You should get the same fixed costs for high and low because they are fixed (the same)

**Exam Tip**  
When calculate the fixed cost always use this layout

Units	High	Low
Total Costs	x	x
Less VC	(-) x	(-) x
Fixed Costs	x	x

Remember

$$\text{Total cost} = \text{Variable Cost} + \text{Fixed Costs}$$

### Step 2

The figures that we use from the question will be

Output Levels	55%	75%	95%
Units	27,500	37,500	47,500
Costs	€	€	€
Production overheads	129,000	173,000	217,000

*Taken from the question*

1. As we have the Total Cost in the question, we can calculate the Variable Cost Per Unit by taken the units is the question and multiply them by the Variable Cost Per Unit Figure (Which is calculated above.)
2. We can then take these two figures away from each other to get the Fixed Cost Figure.
3. We do it twice as a check to make sure we calculate the figure correct. These 2 figures should be the same as they are fixed costs

### **Step 1**

#### **Variable cost per unit**

27,500 x 4.40

121,000

47,500 x 4.40

209,000

Remember

1. 27,500 and 47,500 are the units given in the question
2. €4.40 is the variable cost per unit calculated above

### **Step 2**

<b>Units</b>	<b>47,500</b>	<b>27,500</b>
Total Costs	217,000	129,000
Less VC	209,000	121,000
Fixed Costs	8,000	8,000

### **Step 3**

€8,000	Fixed Costs
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#### **Tutorial Video**



**Separate other overhead costs into fixed and variable elements.**

NOTE – this is the same process as Part A (i) – use the same steps and templates

**Variable Costs**

To calculate the variable costs

1. use the template below
2. And to get the variable cost per unit figure divide the € by the units

**Exam Tip**  
When calculate the variable cost always use this layout

	Units	€
High	x	x
Low	(-) x	(-) x
Difference	x	x

€
Units

€0.00	Variable Cost per Unit
-------	------------------------

**Step 1**

The figures that we use from the question will be

Output Levels	55%	75%	95%
Units	27,500	37,500	47,500
<b>Costs</b>	€	€	€
Production overheads	150,875	203,375	255,875

*Taken from the question*

We use the High / Low method to calculate the Variable Costs Per Unit

1. We take the high figure for the units and take away the low figure and take the high figure for the costs and take away the low figure.
2. From the figures we calculate in 1 above we divide the cost by the units to get the Variable Cost Per Unit

	Units	€
High	47,500	255,875
Low	(-) 27,500	(-) 150,875
Difference	20,000	105,000

20,000
105,000

€5.25	Variable Cost per Unit
-------	------------------------

### Fixed Costs

To calculate the variable costs

1. use the template below
2. You should get the same fixed costs for high and low because they are fixed (the same)

**Exam Tip**  
When calculate the fixed cost always use this layout

Units	High	Low
Total Costs	x	x
Less VC	(-) x	(-) x
Fixed Costs	x	x

Remember

$$\text{Total cost} = \text{Variable Cost} + \text{Fixed Costs}$$

### Step 2

The figures that we use from the question will be

Output Levels	55%	75%	95%
Units	27,500	37,500	47,500
Costs	€	€	€
Production overheads	150,875	203,375	255,875

*Taken from the question*



1. As we have the Total Cost in the question, we can calculate the Variable Cost Per Unit by taken the units is the question and multiply them by the Variable Cost Per Unit Figure (Which is calculated above.)
2. We can then take these two figures away from each other to get the Fixed Cost Figure.
3. We do it twice as a check to make sure we calculate the figure correct. These 2 figures should be the same as they are fixed costs

### **Step 1**

#### **Variable cost per unit**

27,500 x 5.25

144,375

47,500 x 5.25

249,375

Remember

1. 27,500 and 47,500 are the units given in the question
2. €5.25 is the variable cost per unit calculated above

### **Step 2**

<b>Units</b>	<b>47,500</b>	<b>27,500</b>
Total Costs	255,875	150,875
Less VC	249,375	144,375
Fixed Costs	6,500	6,500

### **Step 3**

€6,500	Fixed Costs
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#### **Tutorial Video**



**Prepare a flexible budget for 90% activity level using marginal costing principles, and show the contribution**

The marginal costing principles layout is shown below but there are a few calculate that we have to do first before we prepare the statement. These calculate include

1. Calculate how many units will be produced at 90% activity
2. Calculate VCPU and full figure for Direct Materials (Full figure = Units x VCPU)
3. Calculate VCPU and full figure for Direct Wage (Full figure = Units x VCPU)
4. Calculate the full figure for Production OH. Remember the VCPU has been calculate already in Part a (i) (Full figure = Units x VCPU)
5. Calculate the full figure for Other OH. Remember the VCPU has been calculate already in Part a (ii) (Full figure = Units x VCPU)
6. Production Overhead Fixed cost has been calculate in Part a (i)
7. Other Overhead Fixed cost has been calculate in Part a (ii)
8. Administration Overhead Fixed cost is given in the question so it the same (€38,500)

Sales		x
<b>Less Variable Costs</b>		
Direct Materials	x	
Direct Wage/labour	(+ ) x	
Production Overheads	(+ ) x	
Other Overheads	(+ ) x	(-) x
<b>Contribution</b>		x
<b>Less Fixed Costs</b>		
Production Overheads	x	
Other Overheads	(+ ) x	
Administration Overheads	(+ ) x	(-) x
<b>Profit</b>		x

Remember the cost classification are as follows

**Fixed Costs**                      administration overheads

**Variable Costs**                Direct Labour and Direct Materials

**Mixed Costs**                    Production Overheads and Other Overheads costs

**1. Calculate how many units will be produced at 90% activity**

$$\begin{aligned}
 95\% &= 47,500 \text{ Units} \\
 1\% &= 47,500 / 95 \\
 &= 500 \\
 90\% &= 500 * 90 \\
 &= 45,000 \text{ Units}
 \end{aligned}$$

At 90% activity the business will produce 45,000 units

**2. Calculate VCPU and full figure for Direct Materials (Full figure = Units x VCPU)**

The figures that we use from the question will be

Output Levels	55%	75%	95%
Units	27,500	37,500	47,500
Costs	€	€	€
Direct Materials	151,200	206,250	261,250

*Taken from the question*

Units	High	Low
Total Costs	47,500	261,250
Less VC	(-) 27,500	(-) 151,200
Fixed Costs	20,000	110,000

20,000
110,000

€5.55	Variable Cost per Unit
-------	------------------------

**Full Figure**

$$45,000 \text{ Units} \times €5.55 \text{ Variable Cost Per Unit} = \mathbf{€247,500}$$

**Exam Tip**

This figure can be calculated on the marginal costing statement

**Remember**

45,000 units is the 90% capacity calculated in 1 above

€5.55 is the VCPU calculated in part 2 above

**3. Calculate VCPU and full figure for Direct Wages (Full figure = Units x VCPU)**

The figures that we use from the question will be

Output Levels	55%	75%	95%
Units	27,500	37,500	47,500
Costs	€	€	€
Direct Wage	184,250	251,250	318,250

*Taken from the question*

Units	High	Low
Total Costs	47,500	318,250
Less VC	(-) 27,500	(-) 184,250
Fixed Costs	20,000	134,000

20,000
134,000

€6.70	Variable Cost per Unit
-------	------------------------

**Full Figure**

45,000 Units x €6.70 Variable Cost Per Unit = **€301,500**

**Exam Tip**  
This figure can be calculated on the marginal costing statement

**Remember**

45,000 units is the 90% capacity calculated in 1 above

€5.55 is the VCPU calculated in part 3 above

**4. Calculate the full figure for Production OH.**

45,000 Units x €4.40 Variable Cost Per Unit = **€198,500**

**Remember**

Variable Cost Per Unit of €4.40 has been calculate in part A (i)

**Exam Tip**  
This figure can be calculated on the marginal costing statement

**5. Calculate the full figure for Other OH.**

45,000 Units x €5.25 Variable Cost Per Unit = **€236,250**

**Remember**

Variable Cost Per Unit of €5.25 has been calculate in part A (ii)

**Exam Tip**  
This figure can be calculated on the marginal costing statement

**6. Production Overhead Fixed cost**

This figure has been calculate in Part a (i) and is €8,000

**7. Other Overhead Fixed cost has been calculate in Part a (ii)**

This figure has been calculate in Part a (ii) 6,500

**8. Administration Overhead**

This is a fixed cost as it is the same for each percentage activity of €38,500

<b>Output Levels</b>	<b>55%</b>	<b>75%</b>	<b>95%</b>
Units	27,500	37,500	47,500
<b>Costs</b>	<b>€</b>	<b>€</b>	<b>€</b>
Administration Overheads	38,500	38,500	38,500

Now you can prepare a flexible budget for 90% activity level using marginal costing principles, and show the contribution

Sales		x	Workings
<b>Less Variable Costs</b>			
Direct Materials	247,500		45,000 * 5.50
Direct Wage/labour	(+) 301,500		45,000 * 6.70
Production Overheads	(+) 198,000		45,000 * 4.40
Other Overheads	(+) 236,250	(-) 983,250	45,000 * 5.25
<b>Contribution</b>		x	
<b>Less Fixed Costs</b>			
Production Overheads	8,000		As per the Q
Other Overheads	(+) 6,500		See part A (i)
Administration Overheads	(+) 38,500	(-) 53,000	See part A (ii)
<b>Profit</b>		x	

**To find the sales figure**

The sales figure is 100%. It says in the question that profit is budgeted to be 20% of all sale.

*'Profit is budgeted to be 20% of sales. All units produced are sold.'*

This means that the total variable costs + total Fixed cost are equal to 80%

$$80\% = 983,250 + 53,000$$

$$80\% = 1,036,250$$

$$= 1,036,250 / 80$$

$$= 12,953.125$$

$$100\% = 12,953.125 * 100$$

$$= 1,295,312.50$$

Sales		1,295,312.50	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	247,500		45,000 * 5.50
Direct Wage/labour	(+) 301,500		45,000 * 6.70
Production Overheads	(+) 198,000		45,000 * 4.40
Other Overheads	(+) 236,250	(-) 983,250	45,000 * 5.25
<b>Contribution</b>		x	
<b>Less Fixed Costs</b>			
Production Overheads	8,000		
Other Overheads	(+) 6,500		
Administration Overheads	(+) 38,500	(-) 53,000	
<b>Profit</b>		x	

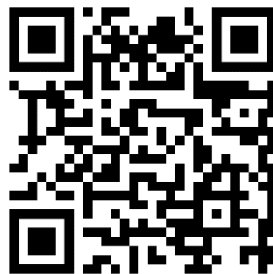
Now we can calculate the contribution. Remember contribution is sales less variable costs. Contribution is a crucial metric because it represents the portion of sales revenue that contributes towards covering the fixed costs and generating profits.

Sales		1,295,312.50	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	247,500		45,000 * 5.50
Direct Wage/labour	(+) 301,500		45,000 * 6.70
Production Overheads	(+) 198,000		45,000 * 4.40
Other Overheads	(+) 236,250	(-) 983,250	45,000 * 5.25
<b>Contribution</b>		312,062.50	
<b>Less Fixed Costs</b>			
Production Overheads	8,000		
Other Overheads	(+) 6,500		
Administration Overheads	(+) 38,500	(-) 53,000	
<b>Profit</b>		x	

Now we can calculate the profit which is contribution less fixed costs

Sales		1,295,312.50	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	247,500		45,000 * 5.50
Direct Wage/labour	(+) 301,500		45,000 * 6.70
Production Overheads	(+) 198,000		45,000 * 4.40
Other Overheads	(+) 236,250	(-) 983,250	45,000 * 5.25
<b>Contribution</b>		312,062.50	
<b>Less Fixed Costs</b>			
Production Overheads	8,000		
Other Overheads	(+) 6,500		
Administration Overheads	(+) 38,500	(-) 53,000	
<b>Profit</b>		259,062.50	

Tutorial Video





**Part B – Option 1 (i)**

Option one says 2 things

1. This will involve employing one new production supervisor at a cost of €40,000.
2. This will save €1.40 per unit in the production overheads.

This means

1. The new production supervisor is a fixed cost as they will receive €40,000. This means the production fixed cost will change to €40,000
2. As the €1.40 is a saving it will reduce the variable production overhead by €1.40

As we have the Marginal Costing statement already completed, we just need to make changes in line with the scenario above.

But first we need to find out how many units will be produced at 100% capacity as per the question

$$\begin{aligned}
 95\% &= 47,500 \\
 &= 47,500 / 95 \\
 &= 500 \\
 100\% &= 500 * 100 \\
 &= 50,000
 \end{aligned}$$

Sales		x	Workings
<b>Less Variable Costs</b>			
Direct Materials	275,000		50,000 * 5.50
Direct Wage/labour	(+) 335,000		50,000 * 6.70
Production Overheads	(+) 150,000		50,000 * 3.00 (4.40 – 1.40)
Other Overheads	(+) 262,500	(-) 1,022,500	50,000 * 5.25
<b>Contribution</b>		x	
<b>Less Fixed Costs</b>			
Production Overheads	40,000		
Other Overheads	(+) 6,500		
Administration Overheads	(+) 38,500	(-) 93,000	
<b>Profit</b>		x	

**To find the sales figure**

The sales figure is 100%. It says in the question that profit is budgeted to be 20% of all sale.

*'Profit is budgeted to be 20% of sales. All units produced are sold.'*

This means that the total variable costs + total Fixed cost are equal to 80%

$$80\% = 1,022,550 + 93,000$$

$$80\% = 1,115,500$$

$$= 1,115,500 / 80$$

$$= 13,943.75$$

$$100\% = 13,943.75 * 100$$

$$= 1,394,375$$

Sales		1,394,375	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	275,000		50,000 * 5.50
Direct Wage/labour	(+ 335,000)		50,000 * 6.70
Production Overheads	(+ 150,000)		50,000 * 3.00 (4.40 – 1.40)
Other Overheads	(+ 262,500)	(-) 1,022,500	50,000 * 5.25
<b>Contribution</b>		x	
<b>Less Fixed Costs</b>			
Production Overheads	40,000		
Other Overheads	(+ 6,500)		
Administration Overheads	(+ 38,500)	(-) 93,000	
Profit		x	

Now we can calculate the contribution. Remember contribution is sales less variable costs.

Contribution is a crucial metric because it represents the portion of sales revenue that contributes towards covering the fixed costs and generating profits.

Sales		1,394,375	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	275,000		50,000 * 5.50
Direct Wage/labour	(+) 335,000		50,000 * 6.70
Production Overheads	(+) 150,000		50,000 * 3.00 (4.40 – 1.40)
Other Overheads	(+) 262,500	(-) 1,022,500	50,000 * 5.25
<b>Contribution</b>		371,875	
<b>Less Fixed Costs</b>			
Production Overheads	40,000		
Other Overheads	(+) 6,500		
Administration Overheads	(+) 38,500	(-) 93,000	
Profit		x	

Now we can calculate the profit which is contribution less fixed costs

Sales		1,394,375	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	275,000		50,000 * 5.50
Direct Wage/labour	(+) 335,000		50,000 * 6.70
Production Overheads	(+) 150,000		50,000 * 3.00 (4.40 – 1.40)
Other Overheads	(+) 262,500	(-) 1,022,500	50,000 * 5.25
<b>Contribution</b>		371,875	
<b>Less Fixed Costs</b>			
Production Overheads	40,000		
Other Overheads	(+) 6,500		
Administration Overheads	(+) 38,500	(-) 93,000	
Profit		278,875	

Tutorial Video



**Part B – Option 2 (i)**

Option one says 2 things

1. Purchase of machinery which would increase the plant's capacity by 15% while
2. reducing all fixed overheads (including administration) by 5%.

This means

1. We have to find out how many units will be produced at 115%
2. Then Reduce all Fixed Overhead by 5%

As we have the Marginal Costing statement already completed, we just need to make changes in line with the scenario above.

But first we need to find out how many units will be produced at 100% capacity as per the question

$$\begin{aligned}
 100\% &= 50,000 \\
 &= 50,000 / 100 \\
 &= 500 \\
 115\% &= 500 * 115 \\
 &= 57,500
 \end{aligned}$$

Sales		x	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	316,250		57,500 * 5.50
Direct Wage/labour	(+) 385,250		57,500 * 6.70
Production Overheads	(+) 253,000		57,500 * 4.40
Other Overheads	(+) 301,875	(-) 1,256,375	57,500 * 5.25
<b>Contribution</b>		x	
<b>Less Fixed Costs</b>			
Production Overheads	7,600		8,000 * 95%
Other Overheads	(+) 6,175		6,500 * 95%
Administration Overheads	(+) 36,575	(-) 50,350	38,500 * 95%
Profit		x	

**To find the sales figure**

The sales figure is 100%. It says in the question that profit is budgeted to be 20% of all sale.

*'Profit is budgeted to be 20% of sales. All units produced are sold.'*

This means that the total variable costs + total Fixed cost are equal to 80%

$$80\% = 1,256,375 + 50,350$$

$$80\% = 1,306,725$$

$$= 1,306,725 / 80$$

$$= 16,334.0625$$

$$100\% = 16,334.06 * 100$$

$$= 1,633,406.25$$

Sales		1,633,406.25	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	316,250		57,500 * 5.50
Direct Wage/labour	(+) 385,250		57,500 * 6.70
Production Overheads	(+) 253,000		57,500 * 4.40
Other Overheads	(+) 301,875	(-) 1,256,375	57,500 * 5.25
<b>Contribution</b>		x	
<b>Less Fixed Costs</b>			
Production Overheads	7,600		8,000 * 95%
Other Overheads	(+) 6,175		6,500 * 95%
Administration Overheads	(+) 36,575	(-) 50,350	38,500 * 95%
<b>Profit</b>		x	

Now we can calculate the contribution. Remember contribution is sales less variable costs.

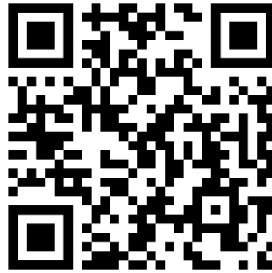
Contribution is a crucial metric because it represents the portion of sales revenue that contributes towards covering the fixed costs and generating profits.

Sales		1,633,406.25	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	316,250		57,500 * 5.50
Direct Wage/labour	(+) 385,250		57,500 * 6.70
Production Overheads	(+) 253,000		57,500 * 4.40
Other Overheads	(+) 301,875	(-) 1,256,375	57,500 * 5.25
<b>Contribution</b>		377,031.25	
<b>Less Fixed Costs</b>			
Production Overheads	7,600		8,000 * 95%
Other Overheads	(+) 6,175		6,500 * 95%
Administration Overheads	(+) 36,575	(-) 50,350	38,500 * 95%
Profit		x	

Now we can calculate the profit which is contribution less fixed costs

Sales		1,633,406.25	<b>Workings</b>
<b>Less Variable Costs</b>			
Direct Materials	316,250		57,500 * 5.50
Direct Wage/labour	(+) 385,250		57,500 * 6.70
Production Overheads	(+) 253,000		57,500 * 4.40
Other Overheads	(+) 301,875	(-) 1,256,375	57,500 * 5.25
<b>Contribution</b>		377,031.25	
<b>Less Fixed Costs</b>			
Production Overheads	7,600		8,000 * 95%
Other Overheads	(+) 6,175		6,500 * 95%
Administration Overheads	(+) 36,575	(-) 50,350	38,500 * 95%
Profit		326,681.25	

**Tutorial Video**



**Part B – Option 2 (ii)**

Choose option 2 because the profit is €47,806.25 higher than in option 1.

**Part C – Theory**

**(c) (i) What is meant by the term sensitivity analysis.**

1. Sensitivity Analysis is also known as ‘what if’ analysis. It is a technique used by management accountants to show the effect on profit brought about by changes in the following:

1. Selling price
2. Sales volume
3. Variable costs
4. Fixed costs

The examples in part (b) of the question are examples of sensitivity analysis.

**(ii) Outline why Henry Ltd would prepare a flexible budget.**

1. To show management the cost levels at different levels of production. It is misleading to compare the budgeted costs at one level of activity with the actual costs at a different level of activity.
2. To compare actual costs and budgeted costs at the same level of activity, in order to determine if actual costs exceeded or were less than budgeted costs.
3. To compare budgeted costs and actual costs in order to identify variances. This allows corrective action to be taken.
4. To help in controlling costs or planning production levels.

Tutorial Video

