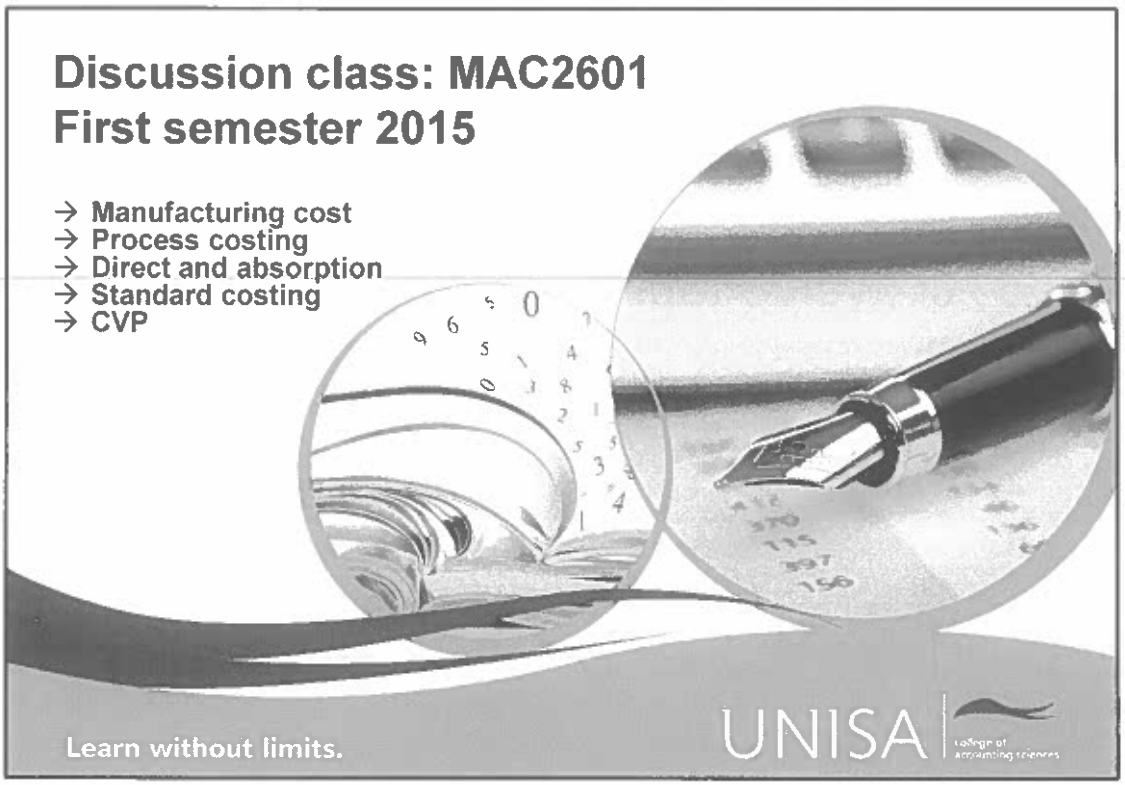


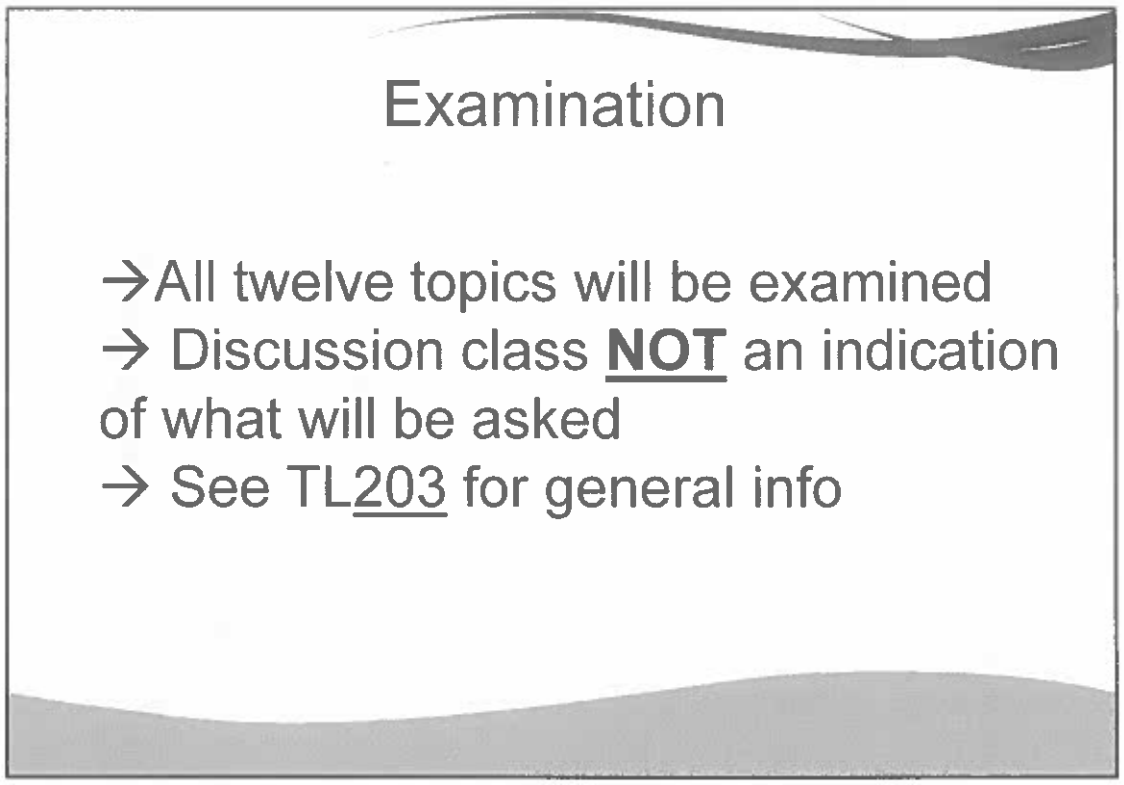
The notes inserted at the bottom of the slides (like the one you are busy reading) should shed some light on some of the slide contents. These notes can be used by students who attended the classes (for revision) and students who were unable to attend alike. We have compiled these notes upon request from and as a courtesy to students.

We selected the topics indicated on this introductory slide (process costing, direct and absorption costing, standard costing and CVP) because students tend to ask a lot of questions about these topics/generally find them difficult. Some of these topics (including especially direct and absorption costing and CVP) are very important for your CTA studies in the future and/or for third-year management accounting (especially standard costing).

We also chose to do a quick discussion of manufacturing cost, as this important principle carries through to all your topics and it is important for you to see the bigger picture.

The contents of the discussion classes are by no means an indication of what will be asked in the exam – you need to study all twelve topics for the exam. We are required by SAICA to teach a certain syllabus and we will also evaluate/assess students based on the entire syllabus. There will thus be something about all twelve topics in the exam.

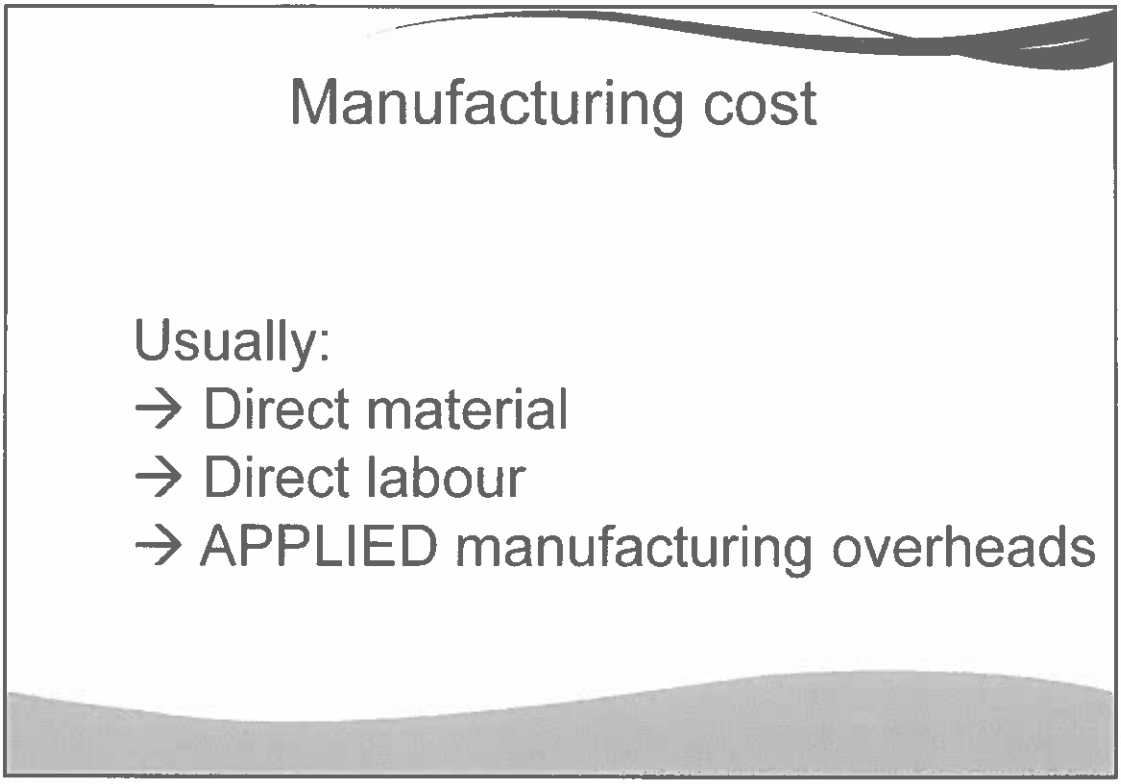
We tried to use one hour for manufacturing cost + process costing together, one hour for standard costing, one hour for direct and absorption costing and 45 minutes for CVP. Students had a break of more or less 15 minutes.



The above was already discussed in the previous section, except that we now added that the additional practice questions in TL203 will be used in class to show students how to approach questions of the topics discussed. This TL can be found on myUnisa if you have not received it through the post yet.

The additional practice questions and other solutions in this TL provide students with ample opportunities to practice as many questions as they can. As we do not ask a lot of theory in this module, we would like to emphasise the importance of practicing what you have learnt (applying it) on questions. You need to practice as many questions as possible under simulated exam conditions – i.e. do them as if you were doing them in an exam. Adhere to the time limits to practice your time management – you cannot afford getting exposed to time management requirements for the first time when you write the actual exam.

TL203 also contains general info about the format of the exam, the solutions to the Oct/Nov 2014 exam paper and the solution to your assignment 3 (which does not have to be submitted, but should be used for self-evaluation and practice purposes - please learn from your mistakes). You will also read there that we have moved the multiple choice-questions to the last question (question 5) as students tend to spend too much time on the MCQ questions to the detriment of other questions.



We discuss the principle of manufacturing cost as it applies to all your MAC2601 topics. Please try to see how it relates to individual topics when you study them – hopefully this will help you to see the bigger picture and that each topics is not "standing alone", but building on the basic principles.

It is important in management accounting that we know how much it cost us to manufacture a product. How will we be able to know what selling price to ask if we do not know what the product cost us? How will we be able to calculate profit without this cost?

Usually product cost consists of direct material, direct labour and APPLIED manufacturing overheads. In MAC2601 direct material should be variable, direct labour will usually variable (unless we state or imply that it is/includes a fixed cost and we can have both variable and fixed manufacturing overheads. The treatment of variable versus fixed overheads a part of product cost or period cost is explained in your topic about direct and absorption costing.

Please do not use actual or budgeted overheads as part of your manufacturing cost – you should use APPLIED overheads (if relevant and possible).

Applied overheads contain an element of BUDGET and an element of ACTUAL.

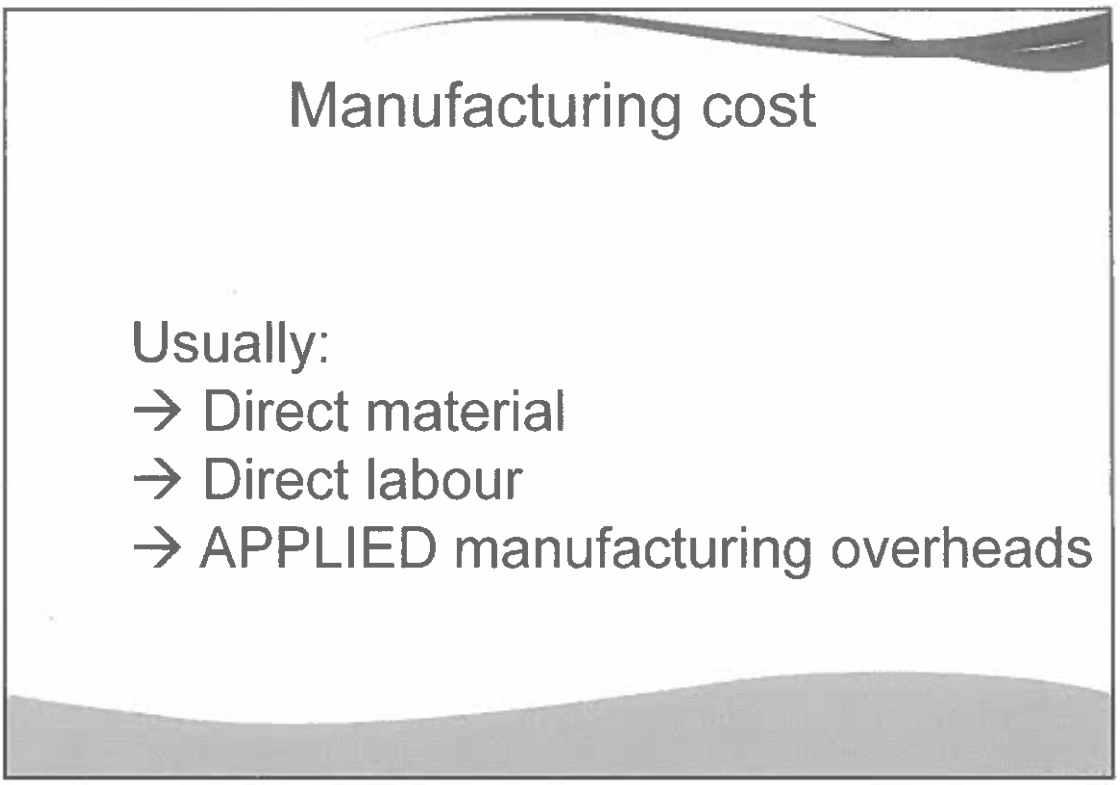
We firstly need to calculate the predetermined overhead rate (or overhead allocation rate) based on **budgeted** figures:

OH rate = Budgeted overheads / Budgeted basis

The basis can be anything such as labour hours, machine hours or production that the company decides to use. You usually have to look out for information in a question about the specific basis that the company in the question will use.

When you have calculated the rate, you will now multiply it with the **Actual Basis** in the question to get to applied overheads:

(continued on next page)

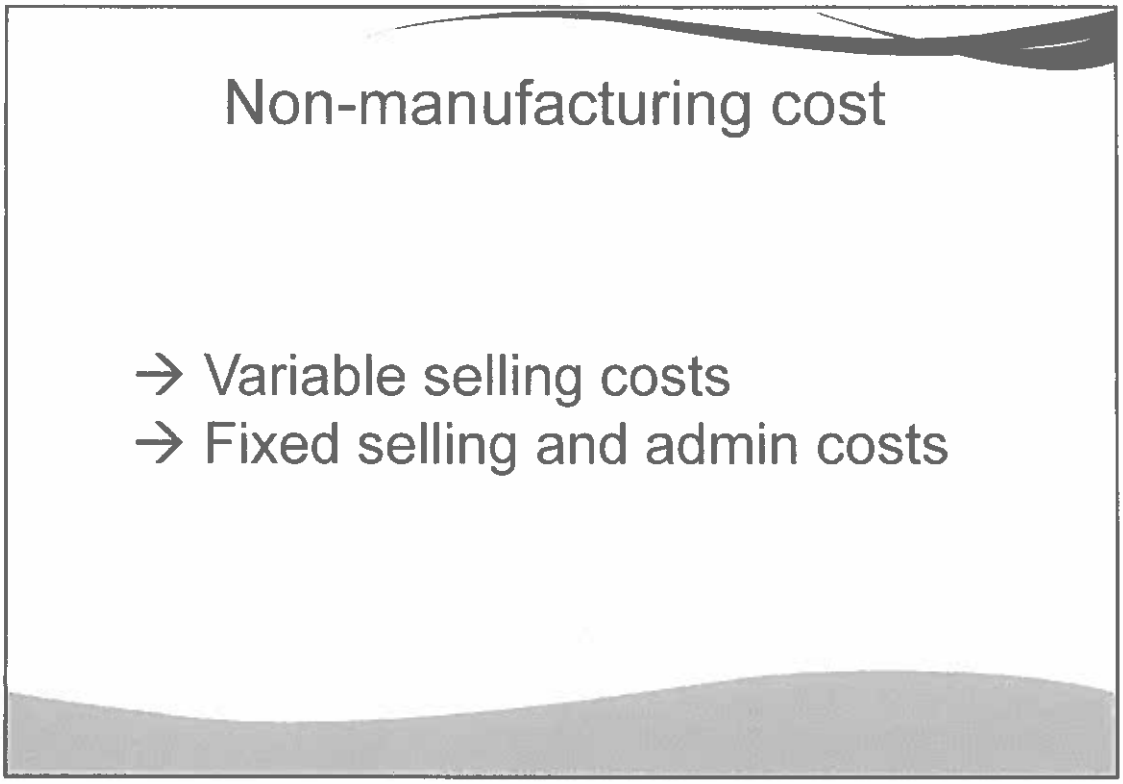


The above slide is a duplicate of the previous, but was added to make available enough space for the notes.

Applied overheads = Rate (based on budgeted figures) x Actual basis

If your basis is for example labour hours, you will now use the actual labour hours to calculate applied overheads.

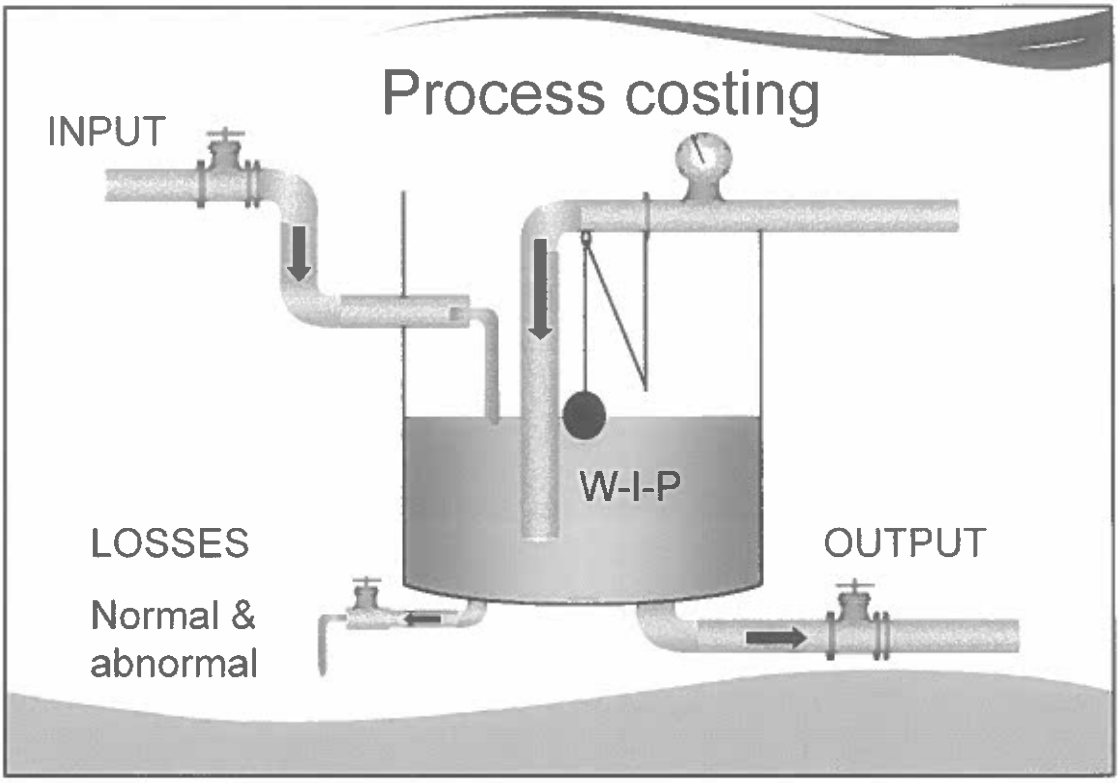
Can you see that applied overheads contain an element of the budget (in terms of the rate) and an element of actuals (in terms of multiplying by the actual basis)?



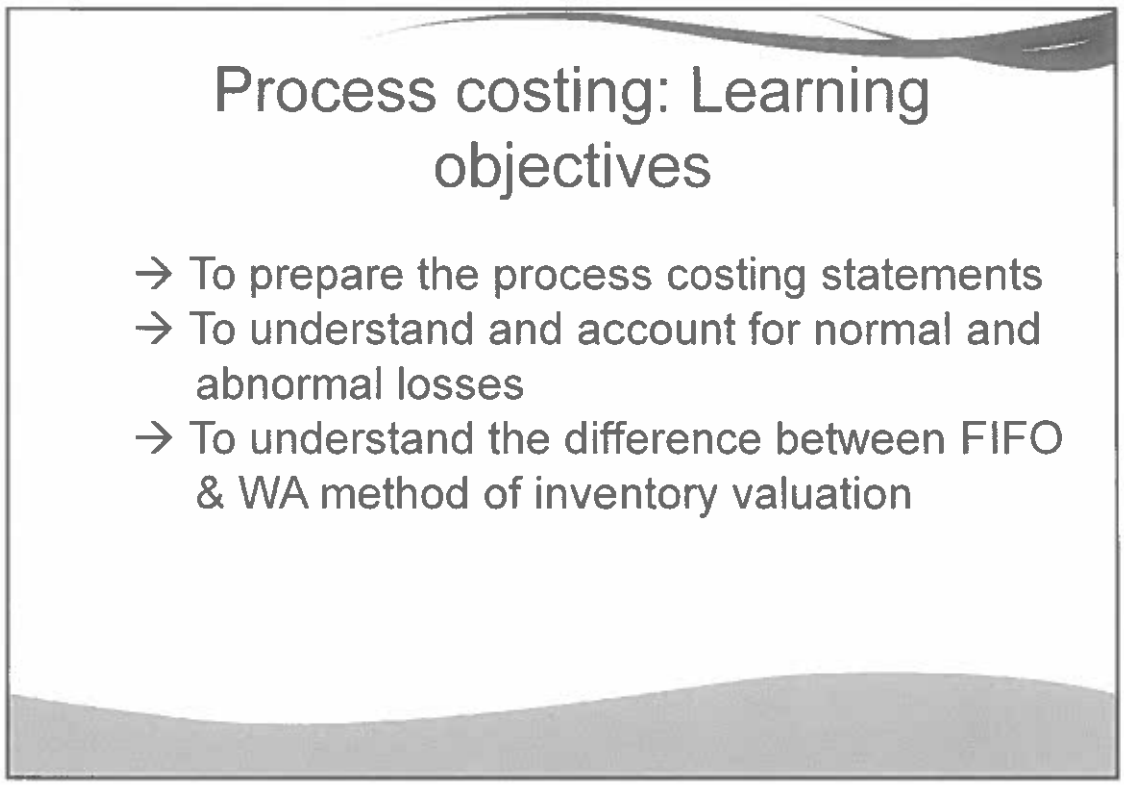
Then we also get non-manufacturing costs: please, these are never part of product costs, so do not include them in your inventory valuations!

For instance, we get variable selling costs and we get fixed selling and admin costs.

Please note that students often make the mistake of basing their total variable selling costs on variable selling cost per unit x units produced: this is wrong. You have to base total variable selling costs on the number of units SOLD! Don't throw away marks by basing these costs on the wrong number of units, please.



We have not specifically discussed this slide – we focused on doing questions, so students can go through the slides that were skipped, on their own.



We have not specifically discussed this slide – we focused on doing questions, so students can go through the slides that were skipped, on their own.

All that we would like to add here, is that you will realise the importance of knowing the differences between the FIFO and weighted average methods – if you are asked to use a certain method in a question and you use the other method, you will lose many, if not all, of your marks. Please ensure you know the differences and apply the method that has been asked for – READ your question!

Work-in-process

Equivalent units?

100 units that are 80% complete is equivalent to….

80 units that are 100% (fully) complete.

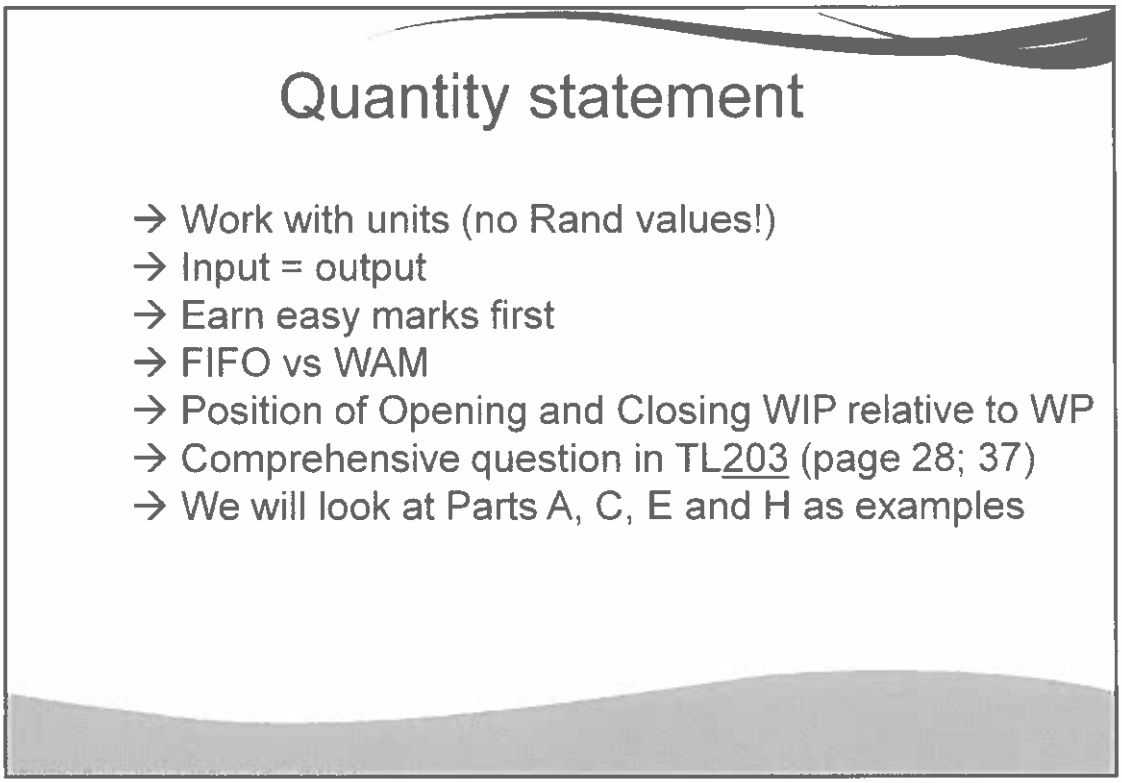
We have not specifically discussed this slide – we focused on doing questions, so students can go through the slides that were skipped, on their own.

3 Process costing reports:

1) Quantity statement
2) Production cost statement
3) Cost allocation statement

We will only have time for 1) and 2)

We did a few quantity statements and production cost statements in class. Students can do cost allocation statements on their own as we did not discuss these due to time constraints – students have many examples available in this regard, including those in their TL 203. The additional question on process costing includes in excess of four hours of process costing questions with eight different scenarios, each with a quantity statement, production cost statement and a cost allocation statement.



A few important things to note about a quantity statement are indicated in the slide above. Many of these will be illustrated when we do the questions.

Please note that we never work with any Rand amounts in a quantity statement – the name QUANTITY statement implies that we work with units. We often have students who include Rand amounts in the quantity statements and this is completely wrong.

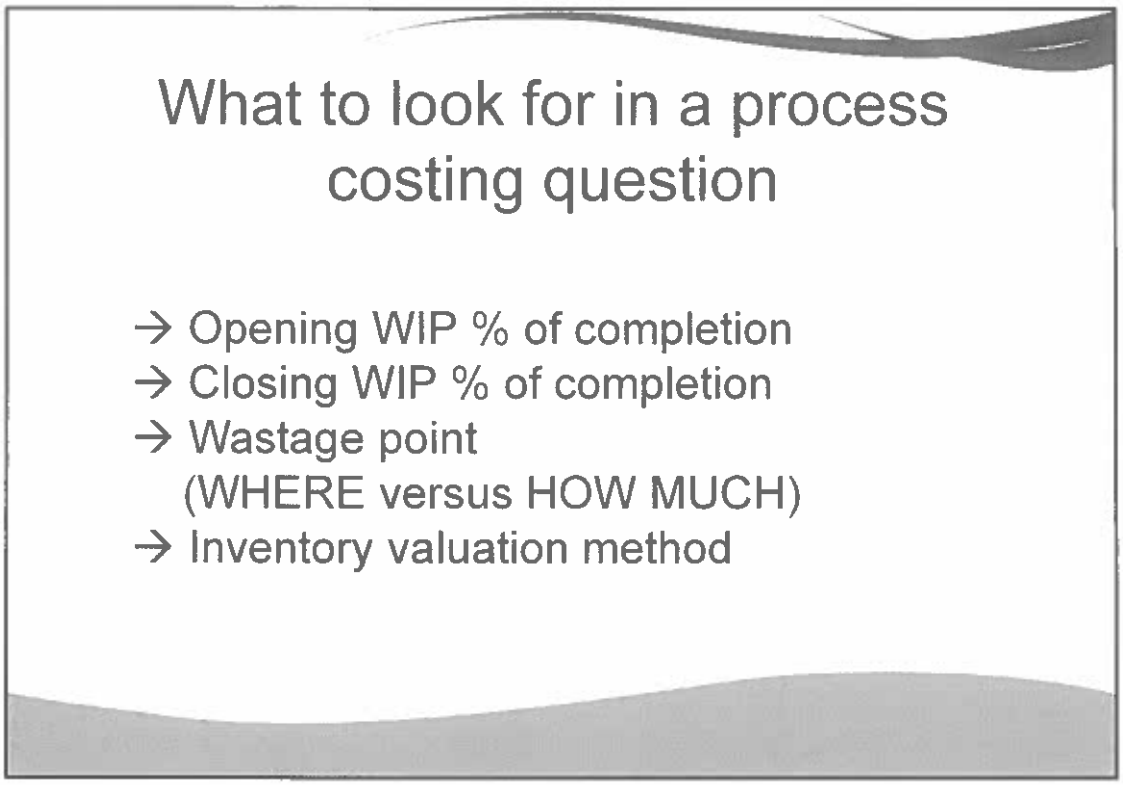
Also note that the total of the input column has to agree to the total of the output column.

We will demonstrate how to score easy marks as early as possible in a standard costing question for in case you run out of time.

As indicated before, it is important for you to know the differences between FIFO and WAM and to apply the method applicable in a specific question.

We will calculate normal losses in our practice questions based on the relative positions of the opening an d closing WIP to the wastage point.

We will only look at parts A, C, E and H for purposes of explaining – students can do the rest of the subsections on their own. They have in excess of 250 marks of additional process costing questions (with solutions) to practice on.



When I attempt a process costing question, I look out for four things in the question immediately. These four things are indicated on the above slide.

Please note the difference between the WHERE of the wastage point and the HOW MUCH of the wastage point: here we are looking for the WHERE.

The WHERE is usually indicated by something like, "Normal losses take place when the process is ____ % complete".

The HOW MUCH is usually indicated by something like, "Wastage amounts to ____% of the units that reach the wastage point".

The inventory valuation method in the question can be either FIFO or the weighted average method ("WAM") and the importance of using the correct method has already been emphasised.

Process costing: Normal losses

Do not confuse the "how much" with the "where".

"WHERE" = The point in the process where losses occur

"HOW MUCH" = % of units that will go to waste when the units reach/pass the wastage point.

We have not specifically discussed this slide – we focused on doing questions, so students can go through the slides that were skipped, on their own.

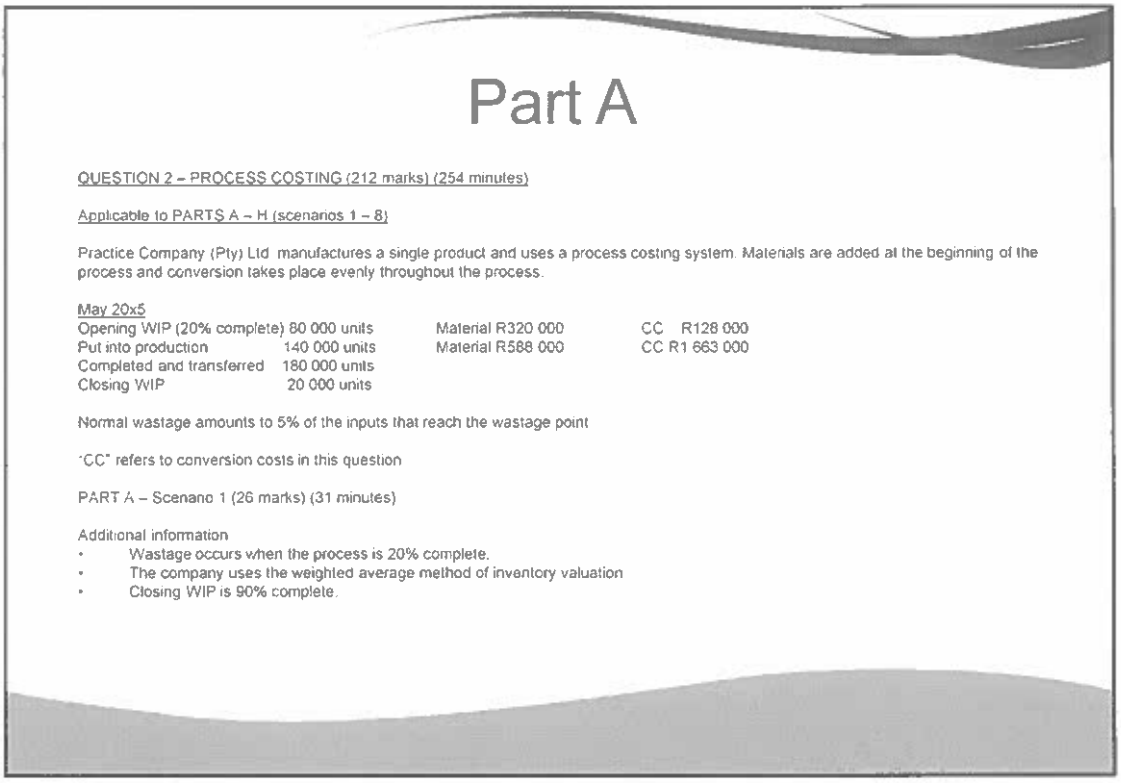
This slide was already incorporated in the previous slide's notes.

How to calculate equivalent units

Details	Material	Conversion
Completed from opening WIP (FIFO only)	0%	**100% - Opening WIP %**
Current production (FIFO) / C+T (WA)	100%	100%
Normal loss	100%	WP
Abnormal loss (if at same place as NL)	100%	WP
Closing WIP	100%	Closing WIP % of completion

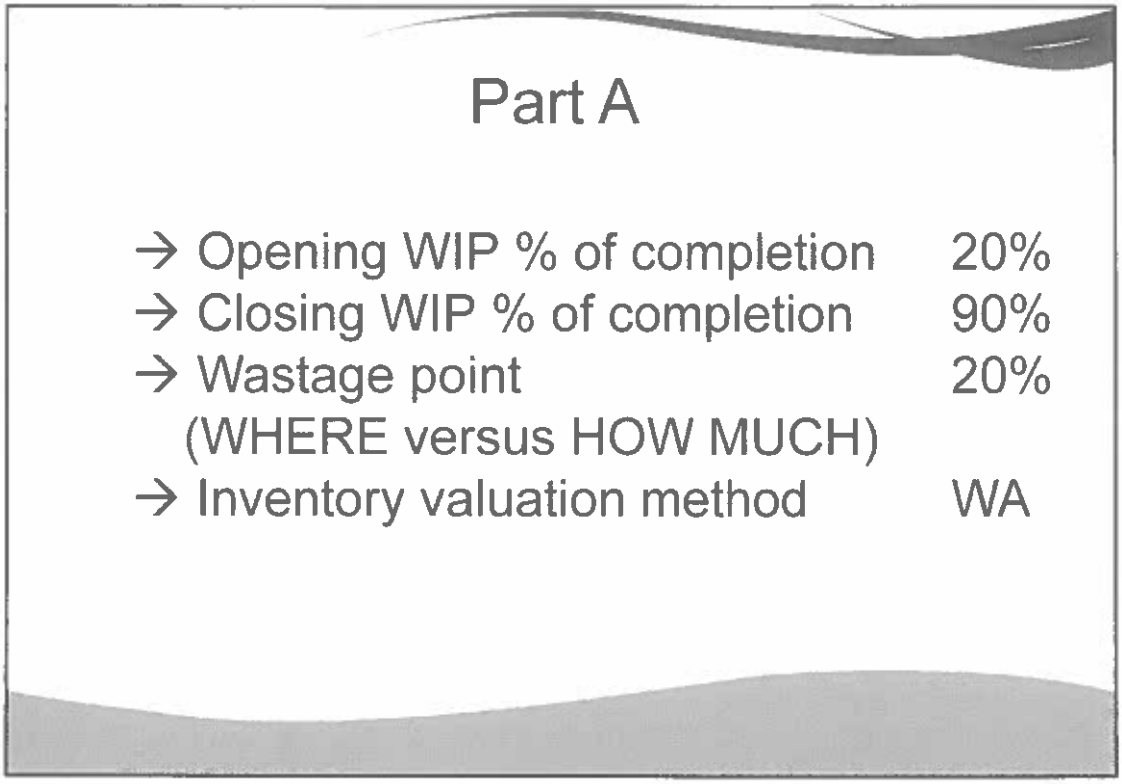
The table in this slide can be used to determine what percentages to use in calculating the equivalent units for materials and for conversion. PLEASE NOTE: when I prepared the slides I accidentally put the section indicated in bold as 100% - WP. This is not correct and I only realised this mistake after the first Pretoria class. Please ensure that if you made a printout of the slides before, you correct this: it has to be 100% - **Opening WIP%**.

We will often refer back to this slide when we do the questions – we will refer back to it as page 13 of the slides WITH NOTES. This number will not correspond with the original slide number as we have added more pages in order to do the explanation of the slides.



You will find this question in your TL203 in the additional questions – we will now be doing part A's quantity statement.

Let us summarise the four things that we should normally be on the lookout for in a process costing question, specifically for this scenario (please see the next slide for this). Opening WIP is 20% complete; closing WIP is 90% complete; the WHERE of the wastage point is at 20% and the inventory valuation method is WAM.



See previous page. This is a summary of the four things we were looking for in part A.

Part A: Quantity statement

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed and transferred	180 000V	180 000^	100	180 000^	100
	Normal loss	7 000V	7 000^	100	1 400^	20
	Abnormal loss	13 000^	13 000^	100	2 600^	20
	Closing WIP	20 000^	20 000^	100	18 000^	90
220 000		220 000	220 000		202 000	

This is the full quantity statement for part A. However, we did the quantity statement bit-by-bit in class and I will try to explain it below – try to follow in the quantity statement above and the inserts I have made in the following few slides (extracts from an incomplete quantity statement):

The first thing we do, is to complete the input column. This is usually straight forward in MAC2601 as the only two inputs that you could get here, are usually given: opening WIP and units put into production. These have been given in our question as 80 000 and 140 000 respectively.

We then get a total for our input column, namely 220 000 in this question.

Part A: Quantity statement

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed and transferred					
	Normal loss					
	Abnormal loss					
	Closing WIP					
220 000						

We have now completed the input column as discussed on the previous slide.

Part A: Quantity statement

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed and transferred					
	Normal loss					
	Abnormal loss					
	Closing WIP					
220 000		220 000				

The next thing we do is to immediately copy the total of the input into the total of the output column, as input has to equal output.

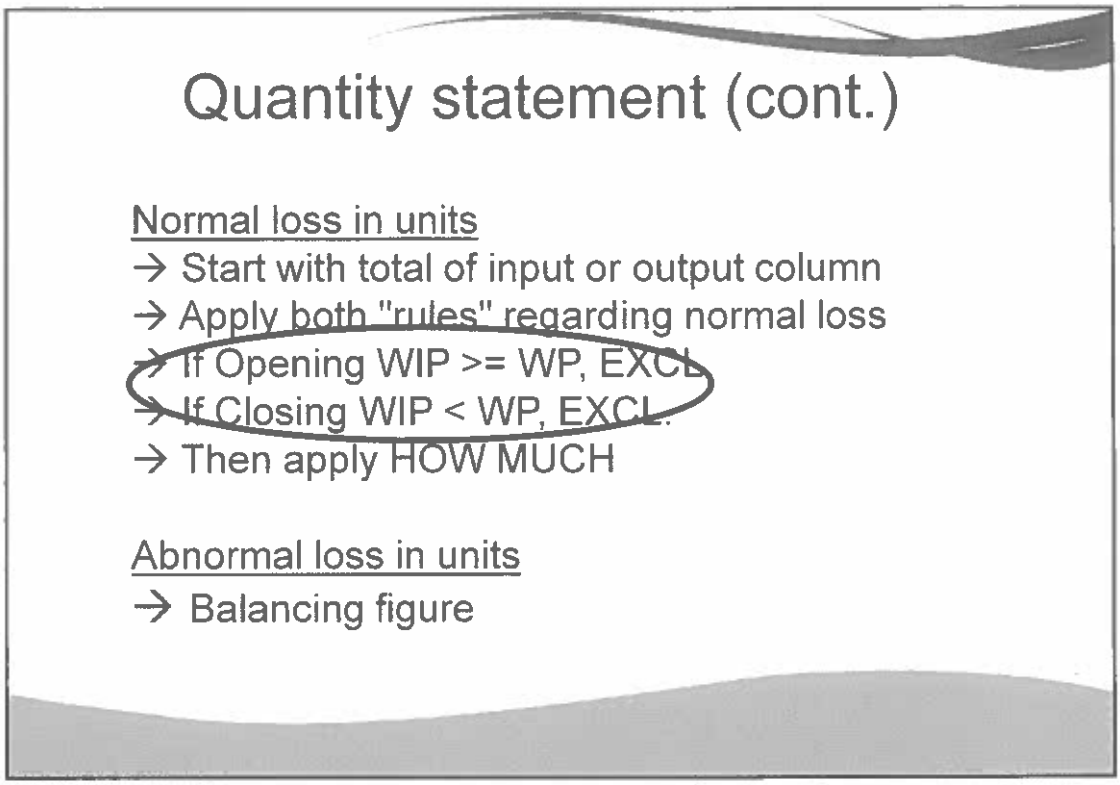
Part A: Quantity statement

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed and transferred	180 000	180 000	100	180 000	100
	Normal loss					
	Abnormal loss					
	Closing WIP	20 000^	20 000^	100	18 000^	90
220 000		220 000				

Now we try to score easy marks first:

1. Fill in the units completed and transferred in the output column (180 000).
2. Carry this through at 100% in both material and conversion (see page 13 of the slides with notes) to score maybe another mark or half a mark.
3. Closing WIP is usually easy. Fill in the closing WIP units (20 000 - given) in the output column.
4. Closing WIP will always be at 100% for material in MAC2601 (see page 13 of the slides with notes) so put 20 000 and 100% in the respective columns for material.
5. Closing WIP will be at the "closing WIP % of completion" (remember we included this % in our summary of the four important things as 90%) for conversion (see page 13 of the slides with notes) so put 18 000 and 90% in the respective columns for conversion. (90% x 20 000 = 18 000)

Equivalent units are calculated based on the relevant percentage (indicated on page 13 of the slides with notes) multiplied by the relevant number in the OUTPUT column, for instance we will have 100% x 180 000 = 180 000 units for material.



Now we will have to calculate the normal loss in units. We will be using the above two "rules" (both of them) to do this. They are not rules in the true sense of the word, but simply our way of explaining and remembering how to treat different parts of info in the calculation of the normal loss for our quantity statement.

We always start the calculation with the total of the input or output column (i.e. 220 000 in this question).

Now we have to apply both rules on this 220 000. From the info in the question:

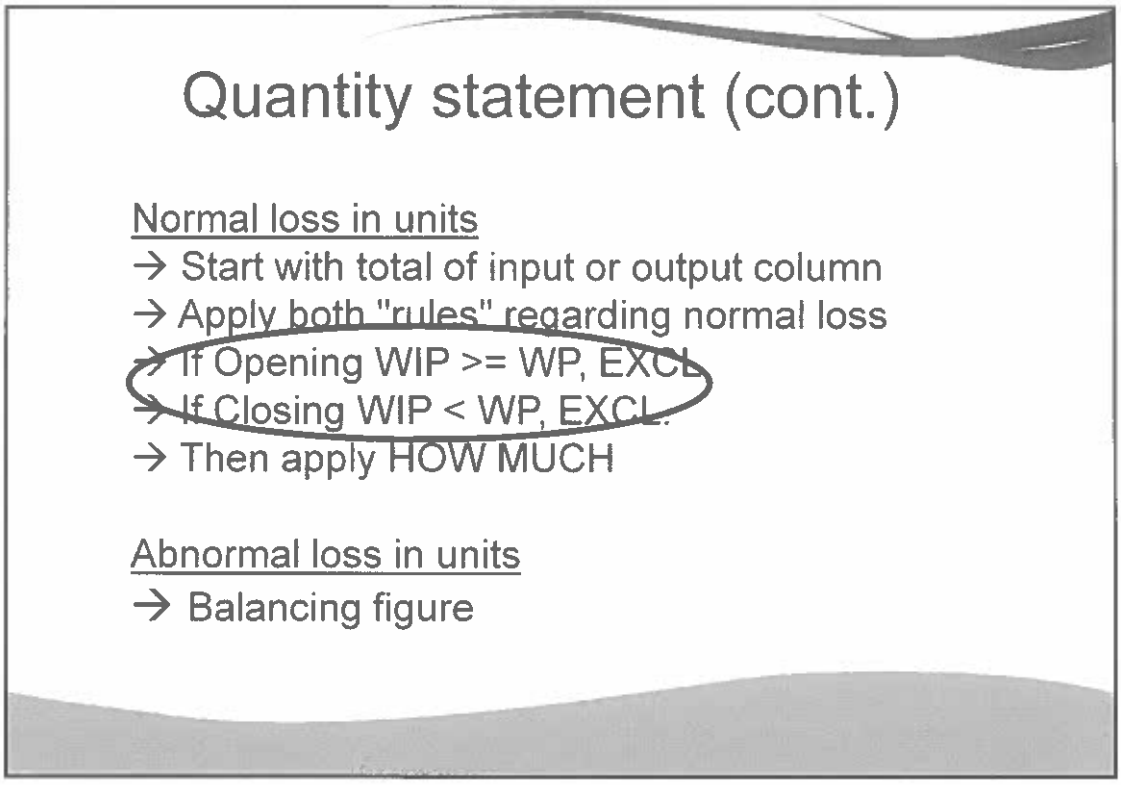
We want to see if
Opening WIP 20% >= WP 20%. If this is true, we will EXCLUDE opening WIP from the calculation.
20% (opening WIP) is indeed equal to 20% (WP), so the statement is true and we will therefore EXCLUDE opening WIP from our calculation.

To exclude opening WIP, we need to subtract the 80 000 units of opening WIP in this question (given as well as included in the input column), from the 220 000, therefore:

220 000 – 80 000 but we are not done with the calculation yet, as we still have to consider closing WIP as well (the second "rule"):

We want to see if
Closing WIP 90% < WP 20%. If this is true, we will EXCLUDE closing WIP from the calculation as well.
90% (closing WIP) is not smaller than 20% (WP), so the statement is NOT true and we therefore do not exclude - we INCLUDE.

Note the difference in signs used for opening and closing WIP: >= (greater than OR equal to) for opening WIP and < (only less than) for closing WIP
(Continued on next page)



In order to Include, we would expect that we would do the opposite of what we did for EXCLUDING, i.e. we would now expect to ADD. This is, however, not correct, as the output column (total 220 000 units) actually already include all the units I have to account for. This means that adding my closing WIP will amount to double counting, so I will not do this. To INCLUDE closing WIP will simply mean I make no adjustments for the closing WIP, so the calculation that I started with, namely

220 000 – 80 000

is kept as is (no further adjustments are made for the 20 000 units of closing WIP as we have to include this).

We can therefore now finalise our calculation as follows:
220 000 – 80 000 = 140 000
Then apply the HOW MUCH of the normal loss (5% in this question):
140 000 x 5% = 7 000 and this will be the NL in our quantity statement. We can fill this in on our statement (see next page).

Part A: Quantity statement

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed and transferred	180 000V	180 000^	100	180 000^	100
	Normal loss	① 7 000V	7 000^	100	1 400^	20
	Abnormal loss	② 13 000^	13 000^	100	2 600^	20
	Closing WIP	20 000^	20 000^	100	18 000^	90
220 000		220 000	220 000		202 000	

We filled in the calculated NL of 7 000 units in our output column. Now we earn "easy" marks by including this 7 000 at 100% for materials and at 20% for conversion (see page 13 of the slides with notes). I use my wastage point (the WHERE) to get to this 20%. 20% x 7 000 output = 1 400 units.

Now we calculate the abnormal loss as a balancing figure in our output column by saying COLUMN TOTAL 220 000 – C+T 180 000 – NL 7 000 – C/WIP 20 000 = AL 13 000 units. Again we earn "easy" marks by including this 13 000 at 100% for materials and at 20% for conversion (see page 13 of the slides with notes). I use my wastage point (the WHERE) to get to this 20%. 20% x 13 000 output = 2 600 units.

If nothing is said about a specific event that led to an abnormal loss at a (different) specific point in the process than the NL, we assume that AL takes place at the same wastage point as the NL, therefore at 20% in this question. Refer to the study guide for AL taking place at a different point, but *usually* (not always though) we have NL and AL at the same point in MAC2601.

Finally I add up the equivalent units for material and the equivalent units for conversion to get the column totals and now my quantity statement is complete.

Quantity statement (Part A)

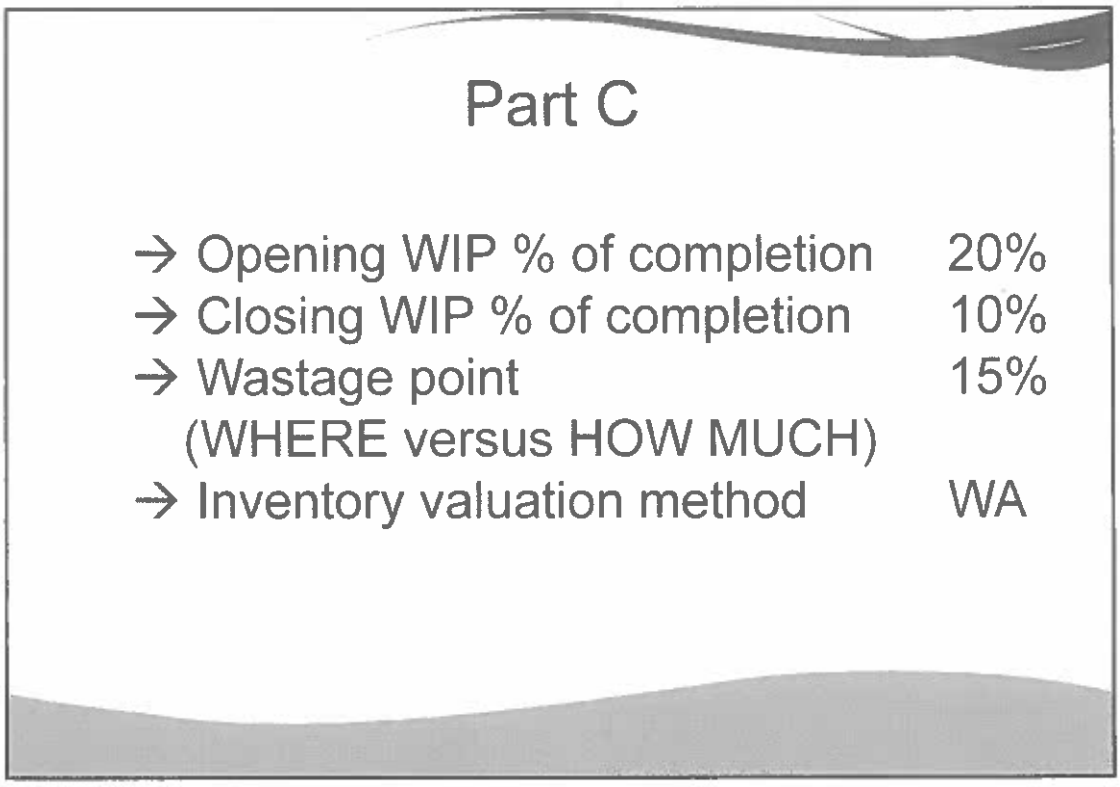
Normal loss in units

→ Start with total of input or output column 220 000
→ Apply both "rules" regarding normal loss
→ If Opening WIP 20% >= WP 20%, EXCL.
→ If Closing WIP 90% < WP 20%, NO: INCLUDE
→ Then apply HOW MUCH
(220 000 – 80 000) x 5% = 140 000 x 5% = 7 000

Abnormal loss in units

→ Balancing figure

This slide shows some of the info and calculations we have already explained with regard to part A of the question.



Now we get to part C. Note how the information provided, has changed: closing WIP is now 10% complete, the WHERE of the normal loss is at 15%, but the remainder stayed the same.

We will now look at how these changes affect the calculation of our normal loss etc. You will see that the input column and the completed and transferred were unaffected by these changes. However, closing WIP (still 20 000 units, but now 10% complete) will now be at 10% in the conversion column (see quantity statement that follows), i.e. at 20 000 x 10% = 2 000 for conversion. Our normal loss and abnormal loss will also be affected.

Again we start the calculation of NL with the total of the input or output column (i.e. 220 000 in this question).

Now we have to apply both rules on this 220 000. From the info in the question:

We want to see if
Opening WIP 20% >= WP 15%. If this is true, we will EXCLUDE opening WIP from the calculation.
20% (opening WIP) is indeed greater than 15% (WP), so the statement is true and we will therefore EXCLUDE opening WIP from our calculation.

To exclude opening WIP, we need to subtract the 80 000 units of opening WIP in this question (given as well as included in the input column), from the 220 000, therefore:

220 000 – 80 000 but we are not done with the calculation yet, as we still have to consider closing WIP as well (the second "rule"):

We want to see if
Closing WIP 10% < WP 15%. If this is true, we will EXCLUDE closing WIP from the calculation as well.
10% (closing WIP) is indeed smaller than 15% (WP), so the statement is true and we therefore also have to EXCLUDE our closing WIP in our calculation. (Continued on next page)

Part C: Quantity statement

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed and transferred	180 000v	180 000^	100	180 000^	100
	Normal loss	① 6 000v	6 000^	100	900^	15
	Abnormal loss	② 14 000^	14 000^	100	2 100^	15
	Closing WIP	20 000^	20 000^	100	2 000^	10
220 000		220 000	220 000		185 000	

We can therefore now finalise our calculation as follows:
220 000 – 80 000 – **20 000** = 120 000

Note that the - 20 000 in bold was now brought into the calculation to exclude the closing WIP of 20 000 units (these 20 000 units were given in the question and can also be found in your output column if inserted correctly).

Then apply the HOW MUCH of the normal loss (5% in this question):
120 000 x 5% = 6 000 and this will be the NL in our quantity statement. We can fill this in on our statement (see above).

Now we earn "easy" marks by including this 6 000 at 100% for materials and at 15% for conversion (see page 13 of the slides with notes). I use my wastage point (the WHERE) to get to this 15%. 15% x 6 000 output = 900 units.

Now we calculate the abnormal loss as a balancing figure in our output column by saying COLUMN TOTAL 220 000 – C+T 180 000 – NL 6 000 – C/WIP 20 000 = AL 14 000 units. Again we earn "easy" marks by including this 14 000 at 100% for materials and at 15% for conversion (see page 13 of the slides with notes). I use my wastage point (the WHERE) to get to this 15%. 15% x 14 000 output = 2 100 units.

Finally I add up the equivalent units for material and the equivalent units for conversion to get the column totals and now my quantity statement is complete.

Quantity statement (Part C)

Normal loss in units

→ Start with total of input or output column 220 000

→ Apply both "rules" regarding normal loss

→ If Opening WIP 20% >= WP 15%, EXCL.

→ If Closing WIP 10% < WP 15%, EXCL.

→ Then apply HOW MUCH

(220 000 – 20 000 - 80 000) x 5%

= 120 000 x 5%

= 6 000

Abnormal loss in units

→ Balancing figure

This slide addresses some parts of what we already discussed.

Quantity statement: FIFO

Quantity statement: FIFO

			Equivalent units			
Input		Output	Raw materials		Conversion costs	
(units)	Details	(units)	Units	%	Units	%
xxx	Work-in-process (opening)					
xxxx	Put into production					
	Completed from: (split)					
	- Opening inventory	Xxx	Xxx	Xx%	Xxx	Xx%
	- Current production	Xxx	Xxx	Xx%	Xxx	Xx%
	Completed and transferred	Xxx	Xxx		Xxx	
	Normal loss	Xxx	Xxx	Xx%	Xxx	Xx%
	Abnormal loss (balancing figure)	Xxx	Xxx	Xx%	Xxx	Xx%
	Work-in-process (closing)	Xxx	Xxx	Xx%	Xxx	Xx%
xxxxx		xxxxx	xxxxx		xxxxx	

Now we get to the FIFO quantity statement. You will see that our format differs from the format used for WAM as we have an additional section: units completed from opening WIP and units completed from current production. It is the units completed and transferred (180 000 (given) in this question) that we now have to split into two numbers.

Just with regard to abbreviations: we used a lot of abbreviations in class to save time and space. More about the acceptable use of abbreviations in MAC2601 can be found in TL202. In short, we do allow you to use abbreviations in MAC2601 to a reasonable extent (this will change in third year and CTA), subject to the requirement that the abbreviations used should be very clear in their meaning (and cannot stand for anything else in the specific context). Also, if you need to write an explanation, recommend a decision, etc. in a theory question, please write out the full words and do not use abbreviations as you demonstrate your writing skills here.

Completed from opening WIP: FIFO

"Rule":
If Opening WIP **<** WP, reduce opening WIP
Part E: 20% is **not** < 15%, opening WIP remains 80 000 units
Part H: 20% is < 100%, therefore reduce opening WIP to 80 000 x 95% = 76 000

When we work with FIFO, the calculation of NL, AL and closing WIP will not be affected if ONLY the inventory valuation method changes. We will therefore illustrate FIFO with part E in the question, as E and A are the same, except for the inventory valuation method.

We will therefore copy everything from the quantity statement in A, except for the new section that we did not have before (split of C+T): see next page for PARTIALLY completed quantity statement. We will use the above slide in order to complete the new section.

Part E: Quantity statement (like part A, but FIFO)

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed from:					
	- Opening WIP					
	- Current production					
	Completed and transferred					
	Normal loss	① 7 000V	7 000^	100	1 400^	20
	Abnormal loss	② 13 000^	13 000^	100	2 600^	20
	Closing WIP	20 000^	20 000^	100	18 000^	90
220 000		220 000				

As you can see, the input column and the bottom section of the quantity statement (except for the column totals, which we will have to calculate at the end) remained the same if only the inventory valuation method changes.

However, other changes to the scenario (for instance a new wastage point, opening WIP% and/or closing WIP%) will indeed affect this bottom section as well.

We can now apply the added rule for FIFO (see previous page) to determine how many units I have to include as output for "Completed from opening WIP".

The "rule" is:
If Opening WIP < WP, reduce opening WIP

Applied to part E, this means we want to see if
Opening WIP 20% is **smaller** than WP of 15%. (Note that this is different from our normal loss rule for opening WIP that we used in the bottom section.) If it is indeed smaller, we will reduce our opening WIP.

However, 20% is **not** less than 15% and we therefore do **NOT** reduce our opening WIP for purposes of the output column in part E – we simply take the 80 000 units that we had in our input column and copy it to "completed from opening WIP" in our output Colum as you will see in the completed quantity statement on the next page.

Part E: Quantity statement (like part A, but FIFO)

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed from:					
	- Opening WIP	③ 80 000v	-^	0	64 000^	80
	- Current production	100 000^	100 000	100	100 000	100
	Completed and transferred	180 000	100 000		164 000	
	Normal loss	① 7 000v	7 000^	100	1 400^	20
	Abnormal loss	② 13 000^	13 000^	100	2 600^	20
	Closing WIP	20 000^	20 000^	100	18 000^	90
220 000		220 000	140 000		186 000	

Our equivalent unit slide is now applied again (page 13 of the slides with notes):

- To get to the material equivalent units, we will always use 0% for units completed from opening WIP. Please show that you know it is 0% by using zeros and or dashes. Anywhere in MAC2601 you have to show if something is 0 otherwise the marker will assume that you did not know the answer and simply left it out.
- To get to the conversion equivalent units, we take 100% - **opening WIP %** of completion (please correct this on page 13 of the slides with notes if yours still show the wrong "100% - WP"). This means that we will use 100% - 20% (opening WIP % of completion) = 80% in the conversion column in E. 80% x 80 000 = 64 000 units.

Current production will be a balancing figure between the C+T (180 000 units; given in the question) and the 80 000 units for "completed from opening WIP". I.e. 180 000 – 80 000 = 100 000 units for units "completed from current production". This current production will carry through at 100% for both materials and conversion.

Note that for WAM it was C+T that carried through at 100%, but for FIFO it is current production that carried through at 100%. For FIFO you will have to calculate subtotals for your C+T by saying in part E above 0 + 100 000 = 100 000 for material and 64 000 + 100 000 = 164 000 for conversion.

Thereafter you can calculate the column totals for material and conversion.

Part H: Quantity statement (like part D, but FIFO)

Physical units			Equivalent units			
Input		Output	Raw materials		Conversion cost	
(units)	Details	(units)	Units	%	Units	%
	Input					
80 000	Opening WIP					
140 000	Put into production					
	Output					
	Completed from:					
	:- Opening WIP	③ 76 000V	-^	0	60 800^	80
	- Current production	104 000^	104 000	100	104 000	100
	Completed and transferred	180 000	104 000		164 800	
	Normal loss	① 10 000V	10 000^	100	10 000^	100
	Abnormal loss	② 10 000^	10 000^	100	10 000^	100
	Closing WIP	20 000^	20 000^	100	18 000^	90
220 000		220 000	144 000		202 800	

Now we will look at part H of the question to demonstrate what we do when we indeed have to reduce the units completed from opening WIP in a FIFO quantity statement.

In part H, our opening WIP % remains at 20%, our wastage now takes place at the end of the process, and our closing WIP is 90% complete.

By the way, wastage taking place at the END of a process means that my WHERE of the wastage is 100%; and wastage taking place at the BEGINNING of a process means that my WHERE of the wastage is 0%.

We can now apply the added rule for FIFO (see previous page) to determine how many units I have to include as output for "Completed from opening WIP".

The "rule" is:
If Opening WIP < WP, reduce opening WIP

Applied to part H, this means we want to see if
Opening WIP 20% is **smaller** than WP of 100%. (Note that this is different from our normal loss rule for opening WIP that we used in the bottom section.) If it is indeed smaller, we will reduce our opening WIP.

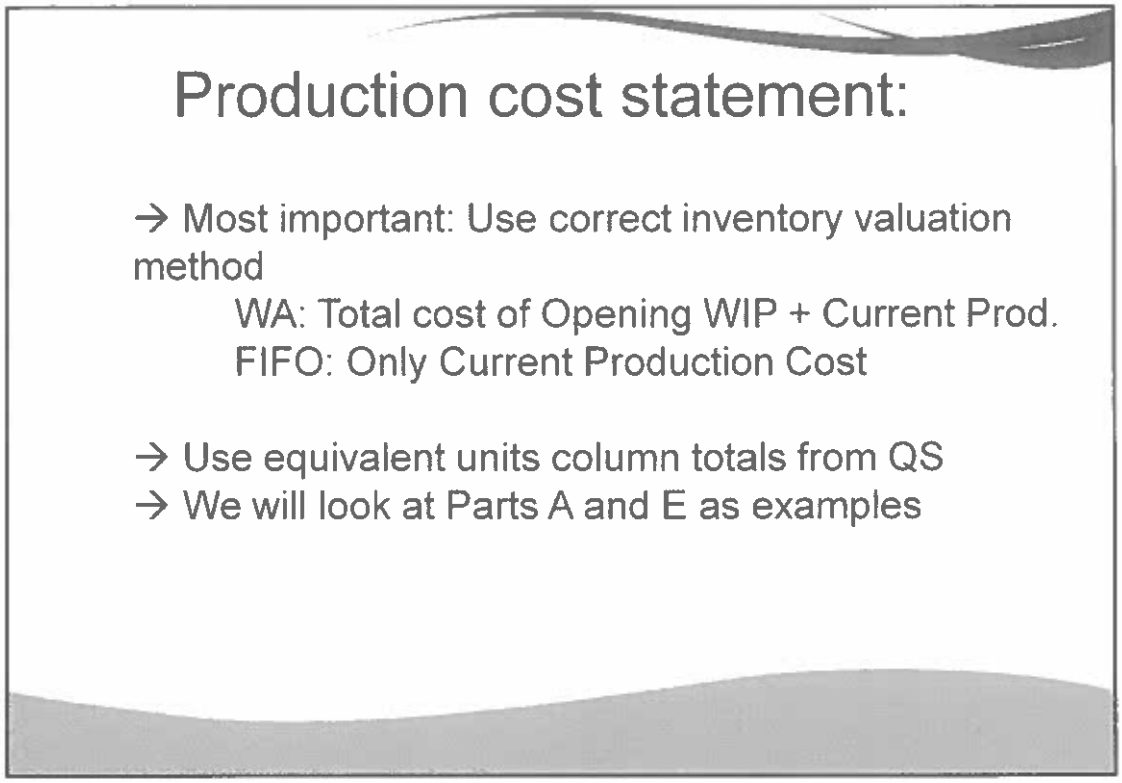
20% is **indeed** less than 100% and we therefore **do** reduce our opening WIP for purposes of the output column in part H.

Firstly we take the 80 000 units that we had in our input column and multiply it by the HOW MUCH (5%) of the loss to get to 80 000 x 5% = 4 000. Then we subtract the 4 000 from the 80 000 opening WIP and get to 80 000 – 4 000 = 76 000. We will include 76 000 in our output column as you will see in the completed quantity statement above.

A shortcut would be to simply say 80 000 x 95% = 76 000, as 100% - 5% = 95%.

The 76 000 will also affect our balancing figure for current production. The balancing figure is now 180 000 – 76 000 = 104 000. The 76 000 will be at 0% x 76 000 = 0 in materials and at 100% - 20% = 80%: 80% x 76 000 = 60 800 in conversion.

The current production of 104 000 carries through at 100%.



Now we will continue with our production cost statement. If you use the incorrect inventory valuation method in a production cost statement in MAC2601, you will get NO marks for it! So please make sure you apply the correct inventory valuation method!

See the above slide for a summary of the difference.

Please note that we usually mark a production cost statement in MAC2601 on a principle basis. This means that even if your column totals in the quantity statement are incorrect, but you have used them correctly in your calculations in the production cost statement, you should still get the marks for the production cost statement. But only if you apply the inventory valuation method correctly!

The above means that if you run out of time with a quantity statement and want to continue with the production cost statement in MAC2601, you can write "assumed" (guessed) column totals in the quantity statement for materials and conversion and use these in your production cost statement. This is not ideal, but you could do this if you run out of time. Please be reasonable in your assumption – if the output column total is 220 000 there is no way in which materials or conversion could have a column total of, for instance, 1 million units!

Production cost statement

FIFO Exclude Opening inventory from calc. of cost per equivalent unit
[Only uses current period costs per equivalent unit.]

WAM Include Opening inventory in calc. of cost per equivalent unit
[All costs incurred (this period and prior period) are added together to find total costs for equivalent units produced.]

The explanation of this slide is incorporated in the explanations of other slides.

Production cost statement: WAM

Production cost statement: WAM	Total R	Material	Conversion costs
Opening WIP	Xxx	xxxxx	xxxx
Current production cost	xxxx	xxxxx	xxxx
Total	Xxxx	xxxxx	xxxx
Equivalent units - per quantity statement		xxxxx	Xxxxx
Equivalent cost per unit	xxxx	= xxx	+ xxxx

A weighted average method production cost statement will include both the values of opening WIP (in the production cost statement we now bring in Rand values for the first time) AND the values of current production in the calculation of equivalent cost per unit. This means that we will have to add opening WIP to current production cost and only then divide the TOTAL thereof by the relevant column total from our quantity statement. We do this for material and conversion separately. And then we add the equivalent cost per unit for material to the equivalent cost per unit for conversion to get to the total equivalent cos per unit. See if you can figure out where we will place which info given in the question, part A, in the above production cost statement.

Production cost statement: FIFO

Production cost statement: FIFO	Total R	Material	Conversion costs
Opening WIP	Xxx		
Current production cost	xxxx	xxxxx	xxxx
Total	Xxxx		
Equivalent units - per quantity statement		xxxxx	Xxxxx
Equivalent cost per unit	xxxx	= xxx	+ xxxx

A FIFO production cost statement will include ONLY the values of **current production** in the calculation of equivalent cost per unit. This means that we will only use current production cost to divide by the relevant column total from our quantity statement. Opening WIP is **not added in the material and conversion columns** (as you can see from the above (greyed-out section)! We do this for material and conversion separately. And then we add the equivalent cost per unit for material to the equivalent cost per unit for conversion to get to the total equivalent cos per unit. See if you can figure out where we will place which info given in the question, part E, in the above production cost statement.

Production cost statement: Part A

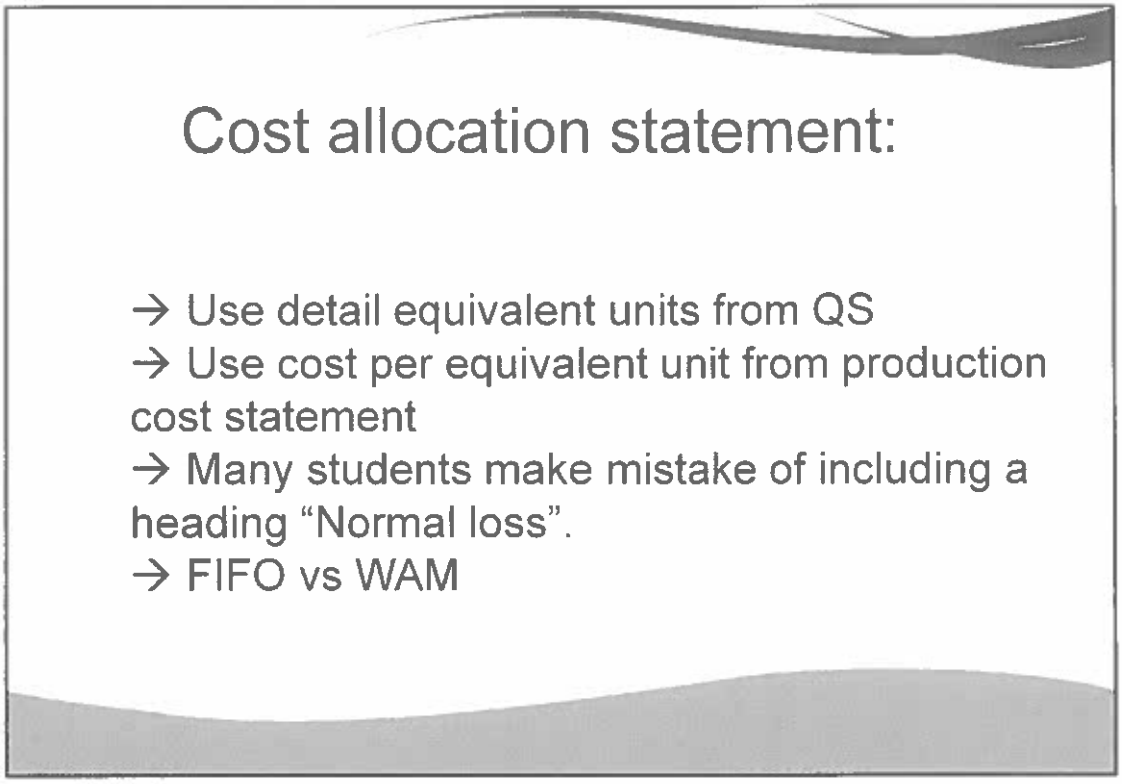
	Total R	Material R	Conversion cost R
Opening WIP	448 000	320 000	128 000
Current production cost	2 251 000	588 000	1 663 000
Total	2 699 000	908 000	1'791 000
Equivalent units - per quantity statement		220 000	202 000
Equivalent cost per unit	R13,00 =	R4,13	+ R8,87

Here is the completed production cost statement for part A (WAM). Can you see that we have incorporated the opening WIP values given in our question? We divide the **totals** of 320 000 + 588 000 = **R908 000** and 128 000 + 1 663 000 = **R1 791 000** by the respective column totals from our quantity statement.

Production cost statement: Part E

	Total R	Material R	Conversion cost R
Opening WIP	448 000		
Current production cost	2 251 000	588 000	1 663 000
Total	2 699 000		
Equivalent units - per quantity statement		140 000	186 000
Equivalent cost per unit	R13,14 =	R4,20	+ R8,94

Here is the completed production cost statement for part E (FIFO). Can you see that we have **NOT** incorporated the opening WIP values given in our question? We divide the **current production costs** of **R588 000** and **R1 663 000** by the respective column totals from our quantity statement.



Students can practice cost allocation statements at home as mentioned earlier.

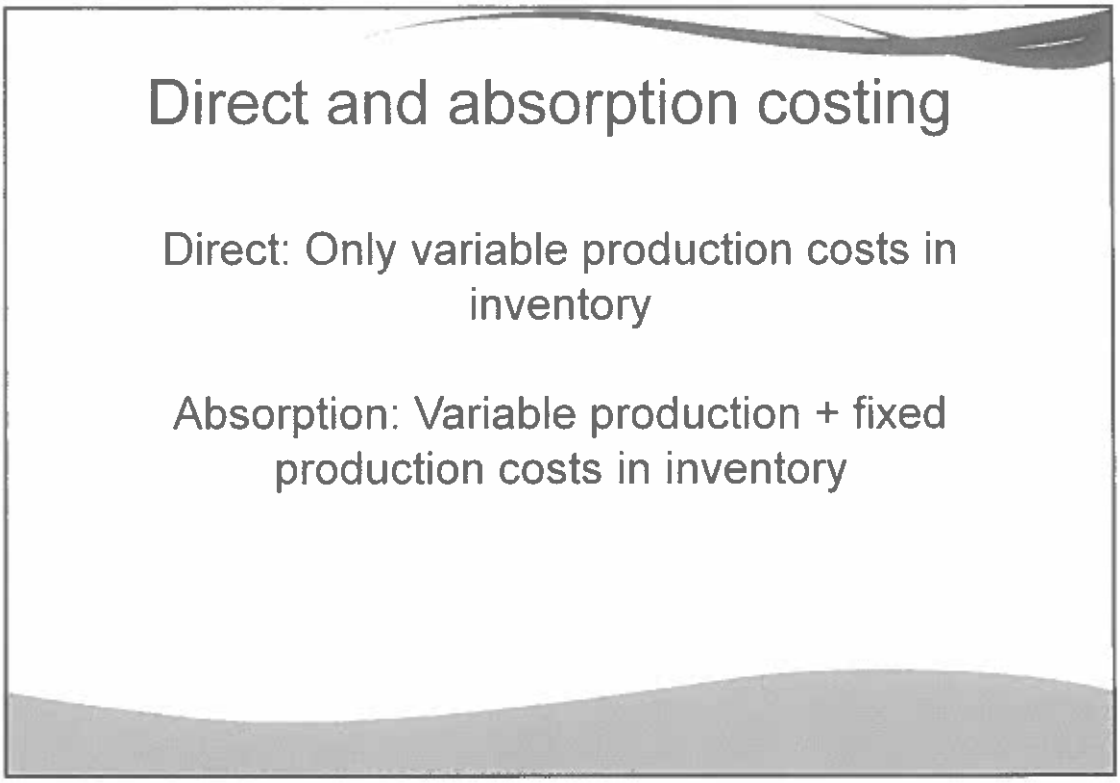
Cost allocation statement

FIFO Disclose opening costs separately.

WAM Opening costs are not disclosed separately.

The position of the normal loss allocated to units completed and transferred differs.

Students can practice cost allocation statements at home as mentioned earlier.



It is very important to know the differences between direct and absorption costing – both for MAC2601 and for further studies. The main difference is in the valuation of inventory: according to the direct costing method, we will only include variable manufacturing costs in our calculation of inventory values; according to the absorption costing method, we will **also include fixed** manufacturing costs in our calculation of inventory values. There are other differences you also need to know, like the fact that we have contribution (which is sales less all variable costs) in a direct costing SOCI and gross profit (which is sales less cost of sales) in an absorption costing SOCI.

Direct and absorption costing

TL203 add. question 9 (page 34)

QUESTION 9 – DIRECT AND ABSORPTION COSTING (15 marks) (18 minutes)

Ekhaya (Pty) Ltd manufactures and sells golf gloves

The following information is available for May, June and July 2014 with regard to unit sales and production.

	May	June	July
Opening inventory	1 750	??	??
Production	54 000	??	??
Closing inventory	??	(8 750)	??
Sales	50 000	??	??

- Sales (in units) for June decreased with 10% from May sales
- Production and sales volume (in units) for July increased with 15% from June
- Ekhaya (Pty) Ltd uses the first-in-first-out (FIFO) method for inventory valuation
- Selling prices, as well as variable selling and administrative costs and variable production cost per unit, remained constant

Additional information:

	May R	June R	July R
Sales	3 500 000	3 150 000	??
Production costs			
- Variable	1 620 000	??	??
- Fixed	1 000 000	1 200 000	1 242 000
Selling and administrative cost			
- Variable	100 000	90 000	??
- Fixed	85 000	90 000	95 000

We will be looking at question 9 of the additional practice questions in your TL203. We are only going to concentrate on the valuation of inventory (opening and closing inventory) as this usually accounts for most of the marks in a direct and absorption costing question. You do need to be able to prepare the entire SOCI as well, according to all four possibilities, so see if you can prepare the four possible SOCIs for this question when you practice.

It is important to note how important it is to show and cross-reference all your calculations in a written question, for instance when you need to prepare an income statement. It is highly unlikely that all students will get all the figures exactly right, so a marker needs to be able to go to supporting calculations to possibly award some marks even if the final answer is incorrect. Often we allocate individual marks or half marks to different parts of a calculation.

Direct and absorption costing

Start with **unit** calculations:

	Period 1	Period 2	Period 3
Opening inventory			
Add: Production			
Units available for sale			
Less: Sales units			
Closing inventory			

In MAC2601, it is usually advisable to calculate your inventory **unit** movements first. You can use the above table as basis for your calculations and adjust it for the number of periods in the question that are relevant.

Remember that:
Opening inventory + Production = Units available for sale
Units available for sale – Units sold = Closing inventory

The above "formulae" can be mathematically rewritten to solve for missing figures.

In the question we will be looking at, there are three periods (May, June and July) and they will all be relevant to the July SOCIs, as the May closing inventory will become June opening inventory, which might affect June closing inventory (depending on the inventory valuation method), which in turn becomes July opening inventory and might affect July closing inventory (depending on the inventory valuation method).

See if you can slot in the UNIT information in the question into their appropriate places in the above calculation. Which numbers are still missing?

Direct and absorption costing

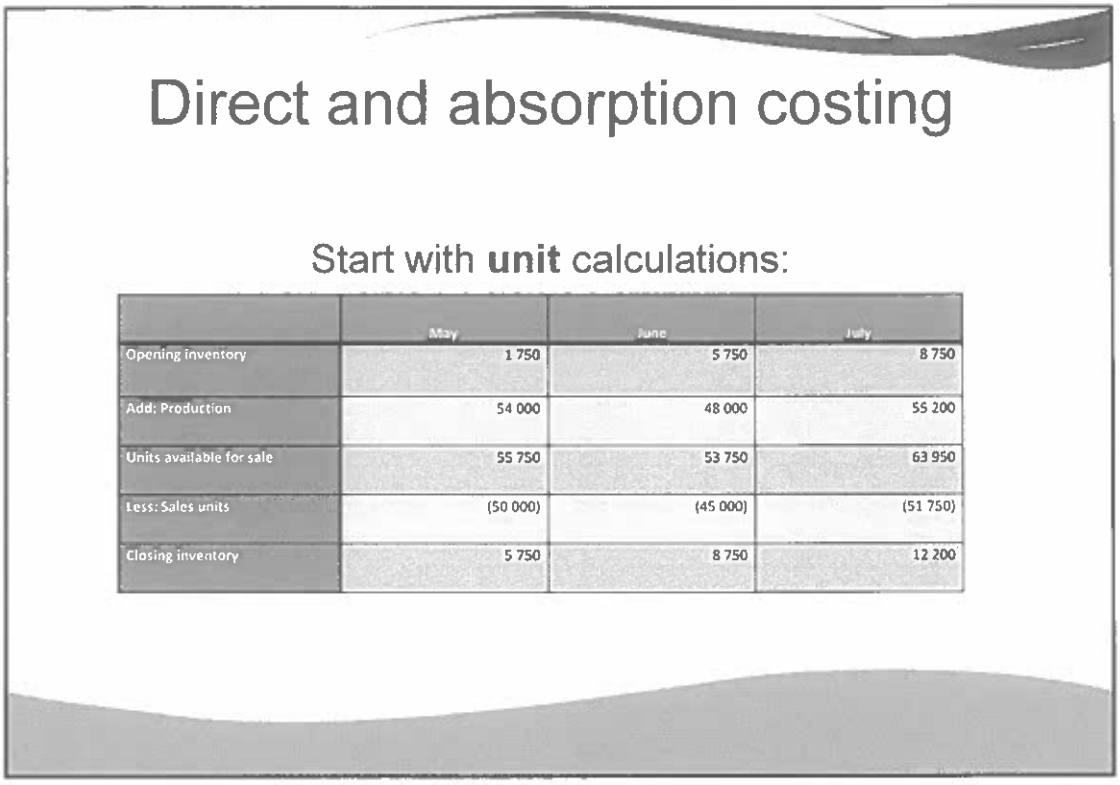
Start with **unit** calculations:

	May	June	July
Opening inventory	1 750	5 750	8 750
Add: Production	54 000	48 000	55 200
Units available for sale	55 750	53 750	63 950
Less: Sales units	(50 000)	(45 000)	(51 750)
Closing inventory	5 750	8 750	12 200

Above we have the completed unit calculations, but we will explain below how each of these were arrived at. Try to get to the missing figures on your own and then see what we did:

1. May opening inventory 1 750: given in the question
2. May production 54 000: given in the question
3. May units AFS: 1 750 + 54 000
4. May sales units 50 000: given in the question
5. May closing inventory: units AFS – units sold = 55 750 – 50 000 = 5 750
6. June opening inventory 5 750: carried forward from May closing inventory (the closing inventory of one period automatically becomes the opening inventory of the next period)
7. June closing inventory 8 750: given in the question (note that although the 8 750 is between brackets, it does not represent "negative" inventory. The brackets were simply used as you will subtract closing WIP in your cost of sales. We could have left out the brackets if we wanted to. So whether there were brackets or no brackets did not matter. You will never get "negative" inventory in MAC2601.)
8. June sales units: in one of the bullet points in the question it was mentioned that there was a 10% decrease in sales volumes from May to June. May sales units were 50 000 units (see above), thus June sales units have to be 50 000 x 90%
   = 45 000.
9. June units AFS: we add the closing units to the sales units to arrive at units available for sale. We "rearrange" the "formulae" mentioned earlier for this.
   8 750 + 45 000 = 53 750.
10. June production units: this can be calculated here as the balancing figure between the opening inventory and the units AFS in June, therefore 53 750 – 5 750 = 48 000.

(continued on next page)



	May	June	July
Opening inventory	1 750	5 750	8 750
Add: Production	54 000	48 000	55 200
Units available for sale	55 750	53 750	63 950
Less: Sales units	(50 000)	(45 000)	(51 750)
Closing inventory	5 750	8 750	12 200

11. July opening inventory 8 750: carried forward from June closing inventory
12. July production: in one of the bullet points in the question it was mentioned that there was a 15% increase in production volumes from June to July. June production units were
48 000 units (see above), thus July production units have to be 48 000 x 115%
= 55 200.
13. July units AFS: 8 750 + 55 200 = 63 950
14. July sales units: the bullet that we referred to previously also stated that the July sales units were 15% more than in June, therefore 45 000 x 115% = 51 750.
15. July closing inventory: units AFS – units sold = 63 950 – 51 750 = 12 200.

We have now completed the calculation of inventory movements for all three periods involved.

Direct and absorption costing

From TL104 (four possible SOCIs):

	Direct		Absorption	
WAM	S -VC =C -FC =NP	AFS Rand AFS units	S -CoS =GP -S&A =NP	AFS Rand AFS units
	If period 1 had no O/s, there will be no difference between O/s FIFO and O/s WAM for period 2		If period 1 had no O/s, there will be no difference between O/s FIFO and O/s WAM for period 2	
FIFO	S -VC =C -FC =NP	Current Rand Current units	S -CoS =GP -S&A =NP	Current Rand Current units

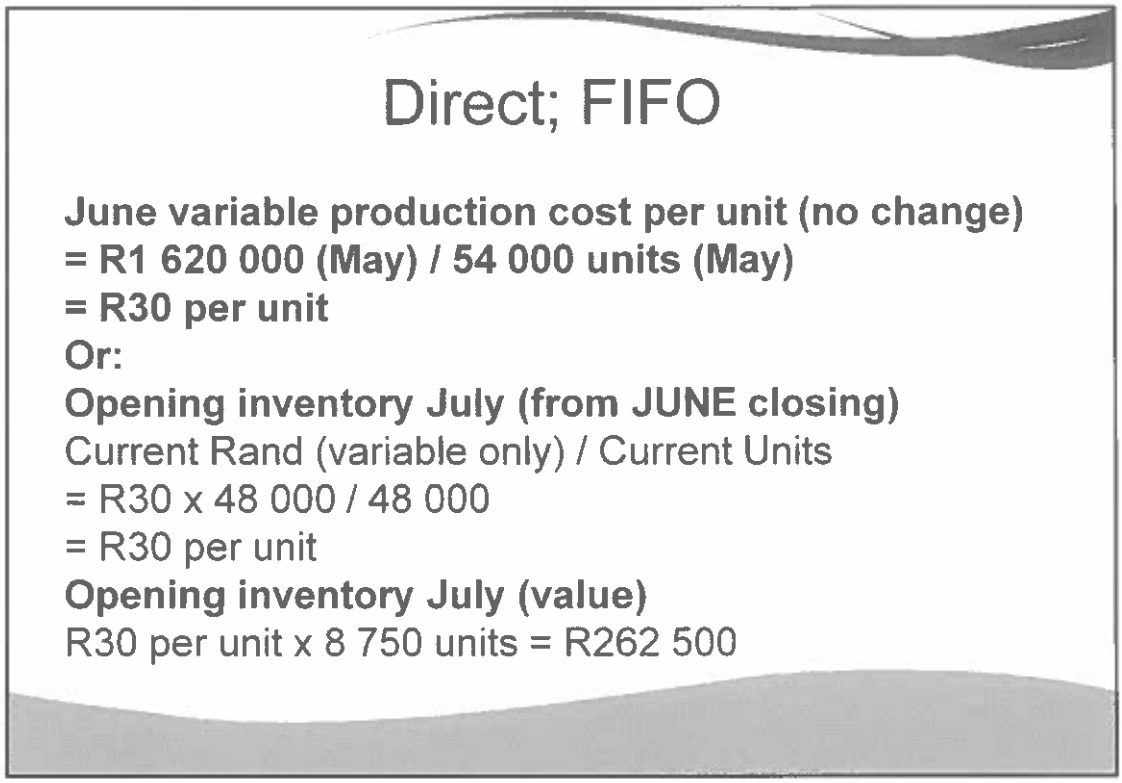
This slide shows a brief summary of the four different SOCIs that you should know how to prepare in this topic. This summary was also included in your TL104.

Please note how the formats of the income statements differ.

Please do not use excessive abbreviations here, eg. do not abbreviate sales, contribution, gross profit, net profit or S&A like we did – we simply wanted to keep the summary as short as possible. Here we often award half a mark to the word "contribution" in a direct costing income statement and half a mark to the word "gross profit" in an absorption costing statement, so please write out these terms. For example, a simple "C" for contribution will not be sufficient, as C could also stand for "cost" or "comprehensive" etc. in the context of an income statement. Likewise "S&A" etc. are not specific enough and we simply used in for the purposes of summarising.

You will also see that we use Current Rand/Current units for FIFO and AFS Rand/AFS units for WAM – these represent the calculations of cost per unit under the respective inventory valuation methods.

The lines that start with "If period 1 had no opening stock..." will not be applicable to the question that we are doing as May represents the first period in this question and May did indeed have some opening inventory. The statement would only apply if May had zero opening inventory. See if you understand the statement and enquire from the lecturers if you do not.



Now let's do the inventory valuations for July according to the direct method + FIFO.

Direct means we will only include variable production costs in inventory; FIFO means that we sell our "oldest" inventory first, so if we sell exactly the same number as or more units than the number of units we had in opening inventory, all closing inventory units will come from current production.

Firstly we need to value July opening inventory. This comes from June opening inventory, which means we have to go back to June figures. However, the variable production cost for June was unknown in the question and will have to be calculated. If we go to the additional information, we will see that there were no changes in variable production cost **per unit** from May to July. If we can calculate the variable cost per unit for May, we can also use it as the variable cost per unit in both June and July.

The total variable cost for May was given in the question (R1 620 000). From our unit calculations, we know that this was the variable cost of producing 54 000 units. This means one unit cost me 1 620 000 / 54 000 = R30 to produce in May.

Because the question states that this cost did not change, we know that R30 also applied in June and July.

If we now want to calculate the June closing inventory, we will simply multiply the R30 by the June closing inventory units of 8 750 and get R262 500. This automatically becomes my opening inventory value for July.

As we are using FIFO, all 8 750 units will be coming from June production and thus be at June current production costs per unit.

Another way of calculating the production cost per unit in July opening inventory will be by means of referring to our summary: FIFO unit cost will be based on Current production in Rand/Current production in units, therefore, for June: (R30 x 48 000) / 48 000 = R30.

Direct; FIFO (cont.)

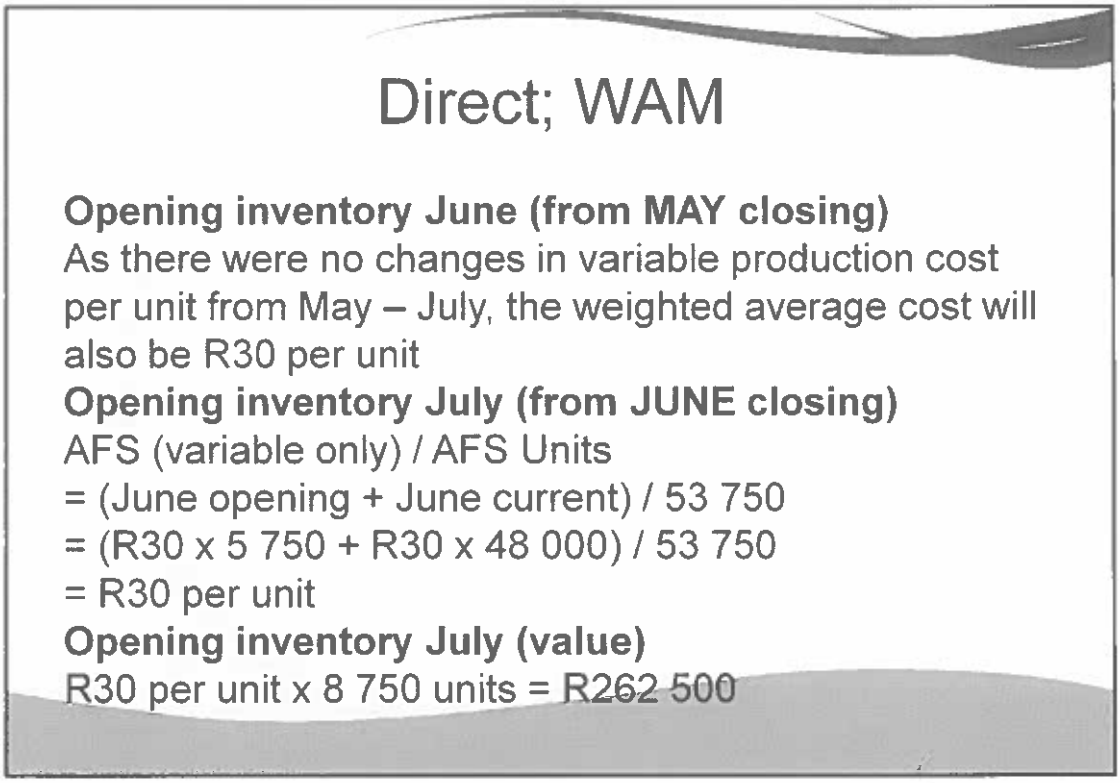
July variable production cost per unit (no change)
= R30 per unit
Or:
Closing inventory July
Current Rand (variable only) / Current Units
= R30 x 55 200 / 55 200
= R30 per unit
Closing inventory July (value)
R30 per unit x 12 200 units = R366 000

Like we said before, July production will also cost us R30 per unit in terms of variable production costs. We are using FIFO and selling more than just the July opening inventory units, which means that all of July's closing inventory will come from July current production.

Our July current production cost per unit is R30 as mentioned before, so the value of our July closing inventory will be R30 x 12 200 units = R366 000.

As we are using FIFO, all 12 200 units will be coming from July production and thus be at July current production costs per unit.

Another way of calculating the production cost per unit in July closing inventory will be by means of referring to our summary: FIFO unit cost will be based on Current production in Rand/Current production in units, therefore, for July: (R30 x 54 000) / 54 000 = R30.



When we work with the weighted average method of inventory valuation, closing inventory value per unit for a period will be calculated by referring to both opening inventory and current production for that period. This means in terms of our question that the June closing inventory will be dependent on June opening inventory and June current production. June opening inventory, in turn, comes from May closing inventory and this is why we have to go back as far as May if we want to calculated July opening inventory (which is equal to June closing inventory).

The weighted average will only change if there are changes in the production cost per unit. In the current question's direct+WAM scenario, there were no changes from the R30 used in May opening inventory and current production, so even the weighted average cost per unit for June will remain at R30 and the June closing inventory value would remain at 8 750 units x R30 per unit = R262 500.

But you need to know how we can calculate this in terms of our summary, as other scenarios may include changes in costs:

Weighted average cost per unit = AFS in Rand / AFS in units

We have to do this calculation for June, as we are trying to determine the June closing/July opening inventory.

June AFS in Rand / June AFS in units
= (June opening inventory value + June current production cost) / (June opening inventory units + June current production units)
= (R30 x 5 750 + R30 x 48 000) / (5 750 + 48 000)
= R1 612 500 / 53 750
= R30

If May opening inventory and May current production was at different costs per unit, you would have to go back to May first and do the above calculation for May to get to the cost per unit to use in June opening inventory.

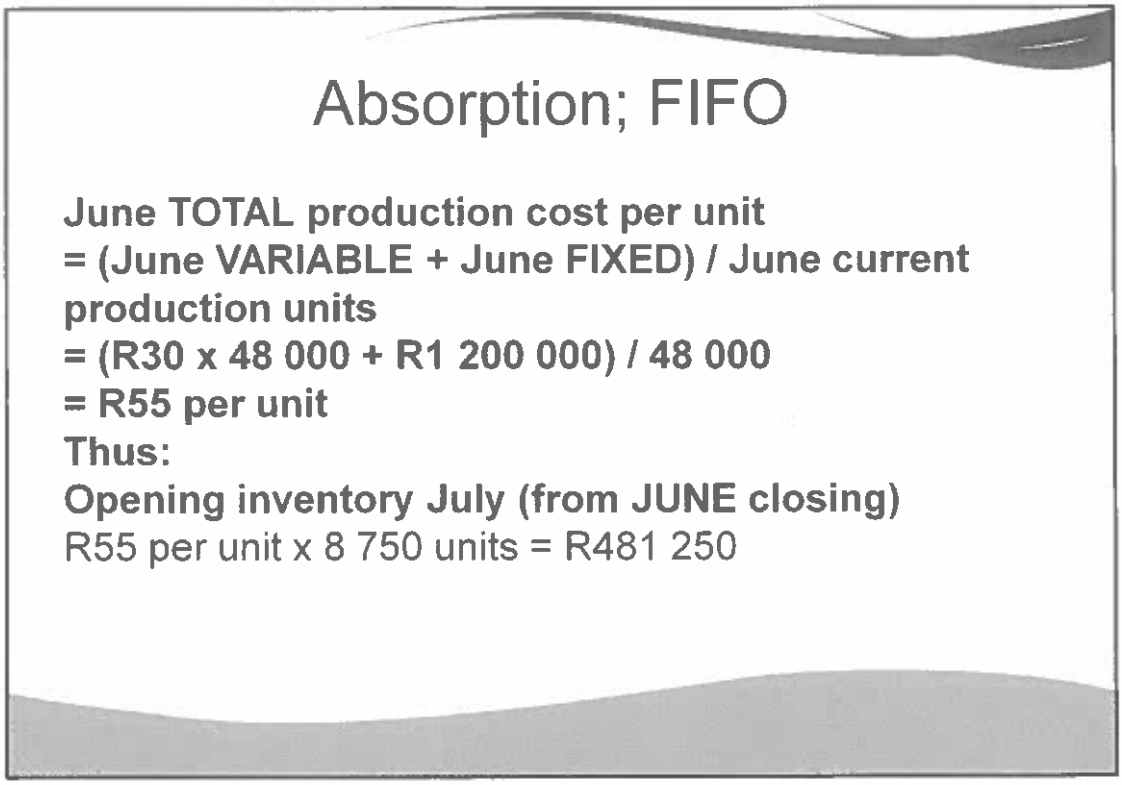
Direct; WAM (cont.)

Closing inventory July
As there were no changes in variable production cost per unit from May – July, the weighted average cost will also be R30 per unit
Closing inventory July
AFS (variable only) / AFS Units
= (July opening + July current) / AFS July
= (R262 500 + R30 x 55 200) / 63 950
= R30 per unit
Closing inventory July (value)
R30 per unit x 12 200 units = R366 000

When it comes to July closing inventory, we will do a similar calculation:

July AFS in Rand / July AFS in units
= (July opening inventory value + July current production cost) / (July opening inventory units + July current production units)
= (R262 500 (calculated for June) + R30 x 55 200) / (8 750 + 55 200)
= R1 918 500 / 63 950
= R30

R30 per unit x 12 200 units = R366 000



We now move on to absorption+FIFO:

In addition to the R30 per unit variable production cost in June closing inventory, we now also need to include some fixed production costs in this inventory value.

From the question we know that we incurred R1 200 000 of fixed production costs in June. Because we are using FIFO and selling more than only our opening inventory in June, we can ignore opening inventory June in the calculation of closing inventory June.

Again we use Current production in Rand / Current production in units to calculate the cost per unit to include in our June closing inventory/July opening inventory, just remember that current production cost now includes both variable **and fixed** production costs as we are now doing absorption costing:

Current production cost in Rand / Current production in units
= (R30x48 000 + R1 200 000)/48 000 (from our unit calculations at the start of the Q)
= R2 640 000 / 48 000
= R55 per unit

R55 per unit x 8 750 units = R481 250 July opening inventory value

Absorption; FIFO (cont.)

July TOTAL production cost per unit
= (July VARIABLE + July FIXED) / July current production units
= (R30 x 55 200 + R1 242 000) / 55 200
= R52,50 per unit
Thus:
Closing inventory July
R52,50 per unit x 12 200 units = R640 500

In addition to the R30 per unit variable production cost in July closing inventory, we now also need to include some fixed production costs in this inventory value.

From the question we know that we incurred R1 242 000 of fixed production costs in July. Because we are using FIFO and selling more than only our opening inventory in July, we can ignore opening inventory July in the calculation of closing inventory July.

Again we use Current production in Rand / Current production in units to calculate the cost per unit to include in our July closing inventory, just remember that current production cost now includes both variable **and fixed** production costs as we are now doing absorption costing:

Current production cost in Rand / Current production in units
= (R30x55 200 + R1 242 000)/55 200 (from our unit calculations at the start of the Q)
= R2 898 000 / 55 200
= R52,50 per unit

R52,50 per unit x 12 200 units = R640 500 July closing inventory value

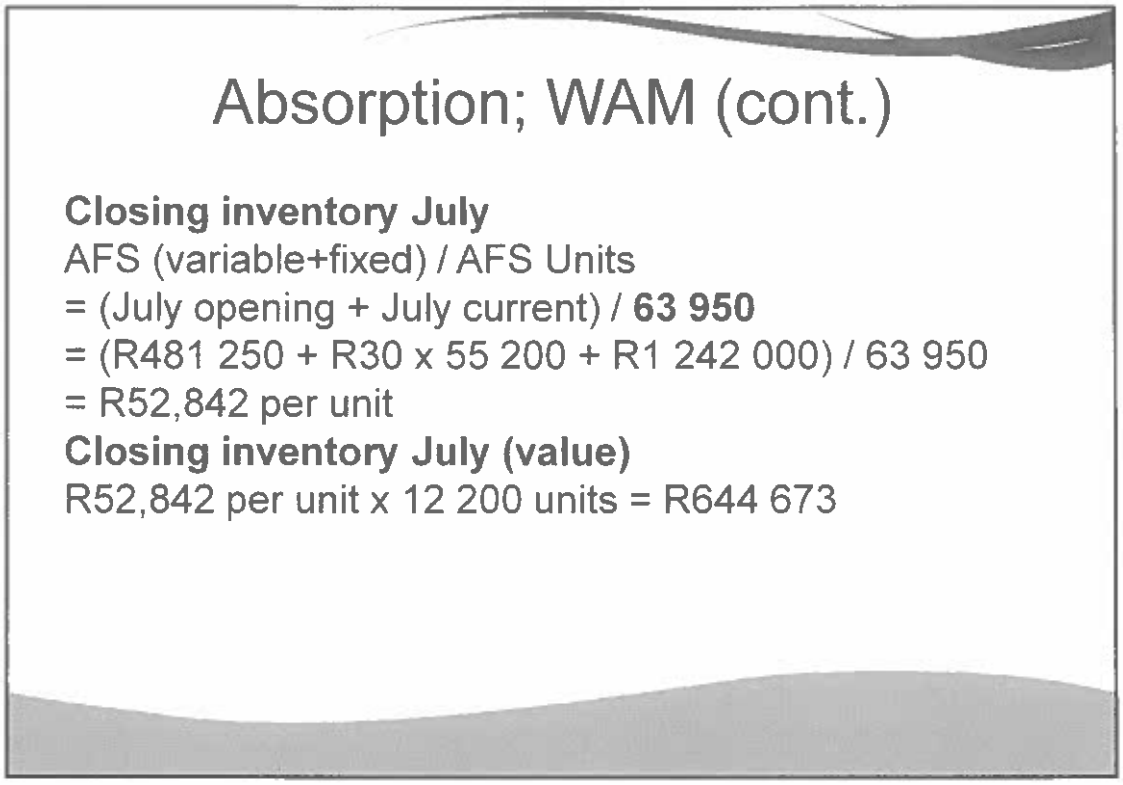
Absorption; WAM

Opening inventory June (from MAY closing)
AFS (variable+fixed) / AFS Units
= Let's just assume it is also R55 per unit
(thus 5 750 x R55 = R316 250 in total)
Opening inventory July (from JUNE closing)
AFS (variable+fixed) / AFS Units
= (June opening + June current) / 53 750
= (R316 250 + R30 x 48 000 + R1 200 000) / 53 750
= R55 per unit
Opening inventory July (value)
R55 per unit x 8 750 units = R481 250

Finally we will also do absorption+WAM. Here we will have to make an assumption due to the fact that we have May opening inventory of which we do not know the value (as this was not given and we do not have information from April).

For purposes of explaining the July figures, we will assume that the cost per unit of the May closing inventory was R55 per unit:

Therefore the June opening inventory value is R55 x 5 750 = R316 250.



We now have to calculate the closing inventory value for June, as July opening inventory is dependent on this.

June AFS in Rand / June AFS in units
= (June opening inventory value + June current production cost) / (June opening inventory units + June current production units)
= (R316 250 + R30 x 48 000 + R1 200 000) / (5 750 + 48 000)
= R2 956 250 / 53 750
= R55

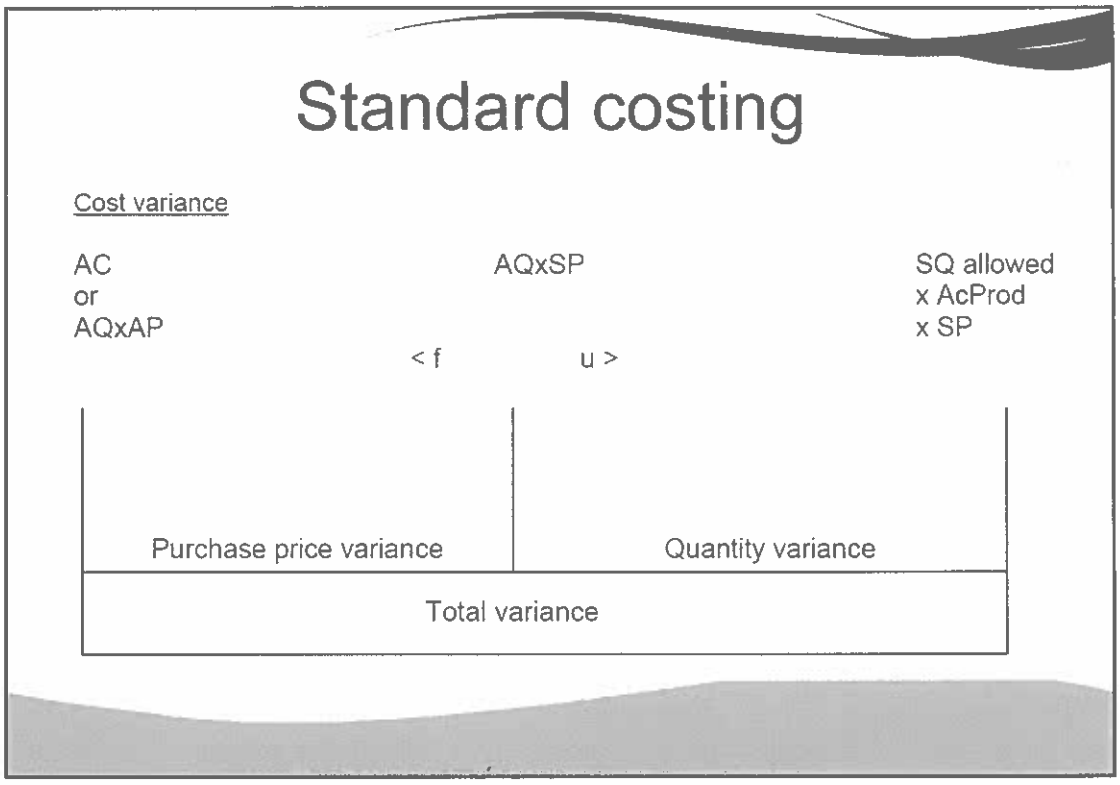
Therefore the July opening inventory value is R55 x 8 750 = R481 250.

July closing inventory cost per unit:

July AFS in Rand / July AFS in units
= (July opening inventory value + July current production cost) / (July opening inventory units + July current production units)
= (R481 250 + R30 x 55 200 + R1 242 000) / (8 750 + 55 200)
= R3 379 250 / 63 950
= R52,842

July closing inventory cost in total:

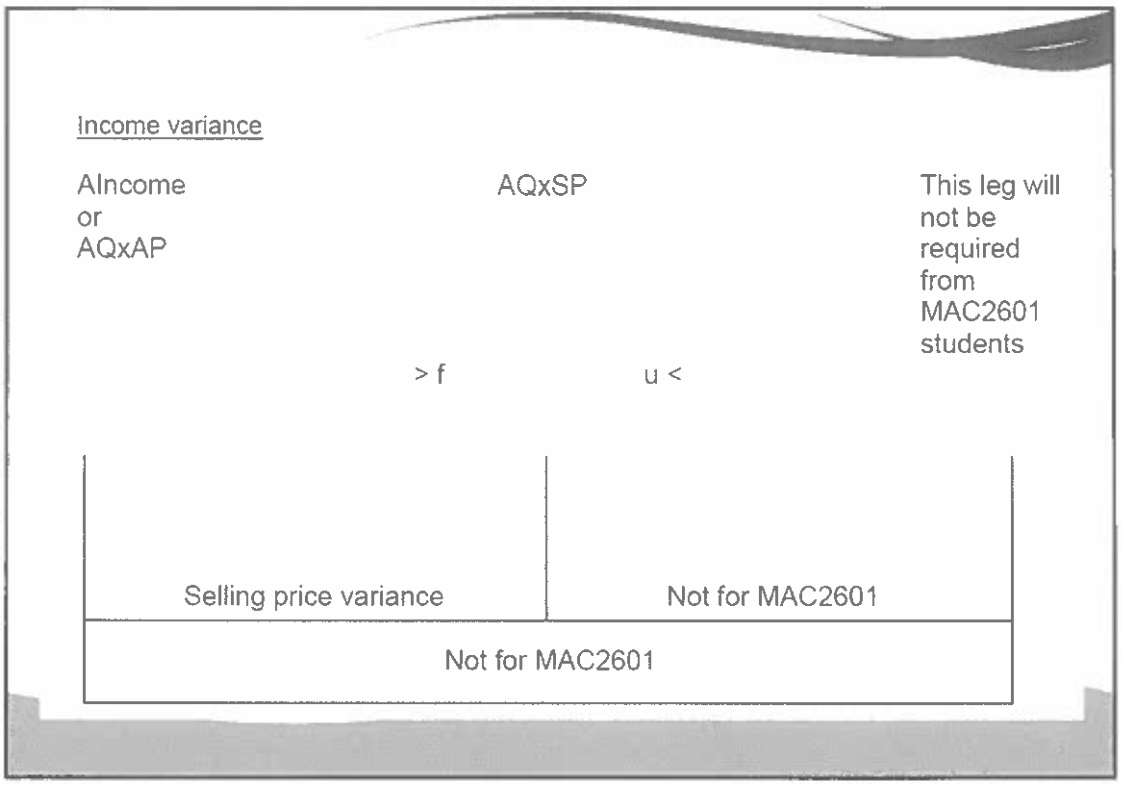
R52,842 x 12 200 = R644 672 (in the slide we used the unrounded R52,842... to calculate the answer – both answers are correct as the difference is only due to rounding)



You can use the diagram above to calculate variances for material, labour and overheads: you are still welcome to use the formulae if you prefer, but many students have indicated that the above diagram helps them with standard costing. Please note that price for material is equivalent to rate for labour and for overheads, but the concept is still the same: a rate is a price of one hour of labour etc. Quantity for material is equivalent to hours for labour and hours/units for overheads (depending on whether overheads vary with hours worked (labour) or with production (units produced). Purchase price variance for material is equivalent to rate variance for labour or overheads and quantity variance for material is equivalent to efficiency variance for labour or overheads.

The diagram allows one to see the bigger picture of what information you already have and what still needs to be calculated and how.

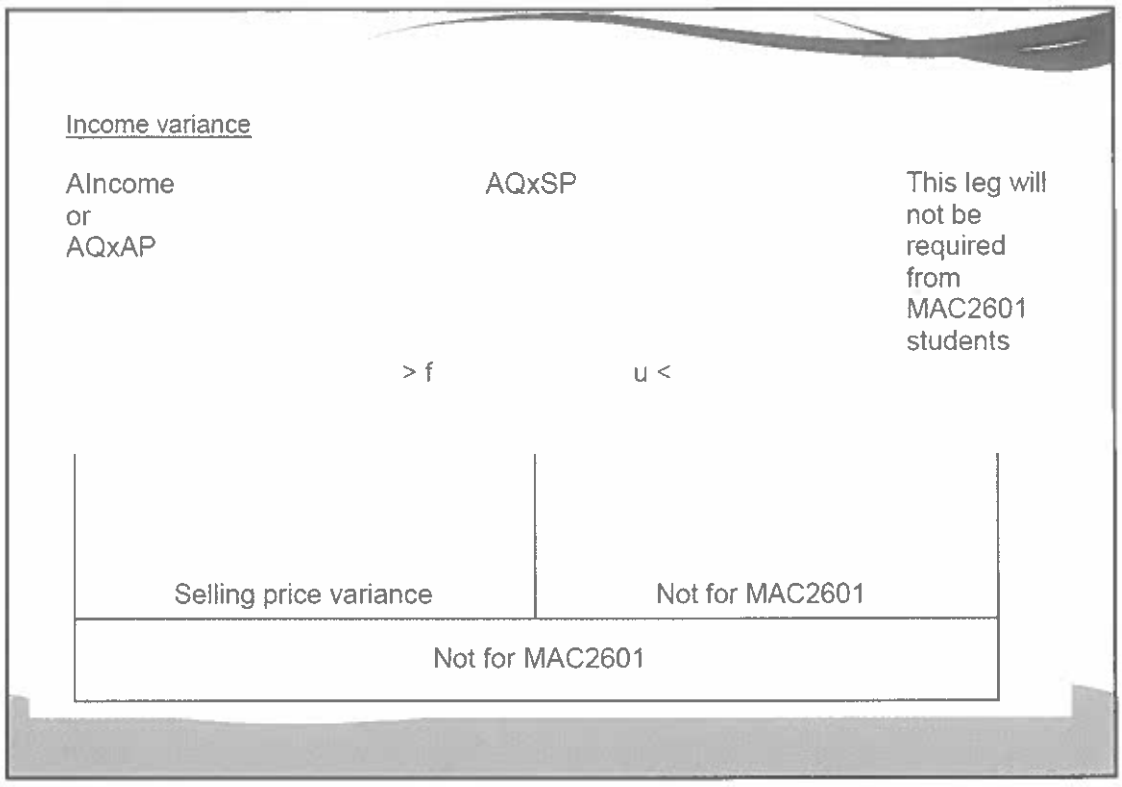
The <f means that if the left-hand side is smaller than the right-hand side, the variance will be favourable. The >u means that if the left-hand side is greater than the right-hand side, the variance will be unfavourable. The reason for this is that if we are dealing with costs (like materials, labour and overheads), it will be unfavourable to the business if our actual costs are more than what we "planned for" (standard).



You can use the diagram above to calculate the selling price (sales price) variance: you are still welcome to use the formula if you prefer.

The main differences between this diagram and the previous are that we now have Actual Income and not Actual Cost and the signs of the favourable (>) and unfavourable (<) are the other way round (NB) as we are now dealing with an income.

The >f means that if the left-hand side is greater than the right-hand side, the variance will be favourable. The <u means that if the left-hand side is less than the right-hand side, the variance will be unfavourable. The reason for this is that if we are dealing with income, it will be unfavourable to the business if our actual costs are less than what we "planned for" (standard).



The only variance you need to know with regard to sales for MAC2601 is the selling price (sales price) variance. You will do more selling variances in MAC3701.

How to approach a standard costing question

- Use clear numbering if diagram is used
- One diagram for material; one for labour; etc.
- Read through question and substitute each relevant piece of info into diagram
- See bigger picture of what is missing; if it has to be calculated and how
- Do the relevant calculations
- Remember favourable/unfavourable

The above slide explains how to present your answer if you prefer using the diagram. Just make sure your numbering is clear: for example, if you use one diagram to answer both questions (a) and (b), put "(a) and (b)" where you start using your diagram to show that you are answering both questions "in one". Then also put the (a) next to the final answer to question (a) wherever you showed it in your diagram and put the (b) next to the final answer to question (b) wherever you showed it in your diagram in order not to create confusion as to where in your diagram what was calculated.

Use a separate diagram for material and for labour and for overheads, etc. based on what you are required to calculate.

Let's assume the question starts with asking a material variance. Read through the question and substitute each piece of information that is relevant to materials into your diagram. After substitution you should be able to see what is still missing and how to calculate it. Just make sure that you do not spend time on calculating something that is not necessary or possible to calculate.

Use a similar approach for labour variances and for overhead variances.

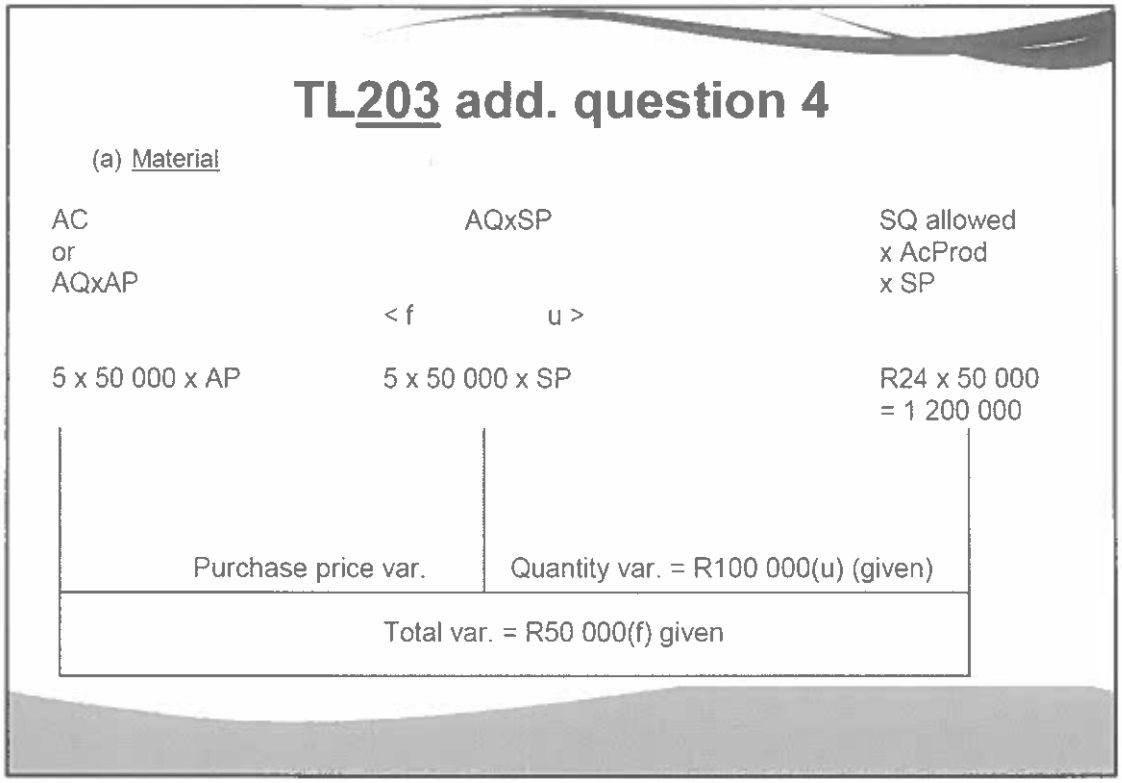
Always show all your calculations.

Always show whether a variance is favourable or unfavourable as it usually counts half a mark in a written variance question.

TL203 add. question 4

Standards per unit of the final product	
Direct materials	R24
Direct labour (R90 per hour)	R18
Variable manufacturing overheads (vary with hours worked)	R10
Selling price	R70
Actual results	
Direct materials (5kg per unit)	?
Direct labour (R94 per hour)	R1 034 000
Variable manufacturing overheads (vary with hours worked)	R500 000
Sales (50 000 units of the final product were produced and sold)	R3 400 000
Variances already calculated	
Material quantity variance (unfavourable)	R100 000
Total material variance (favourable)	R50 000

Here is the question we looked at in class. We haven't copied the Required here – you can find it in your TL203. We will calculate everything that we can with regard to material, labour and overheads, as well as with regard to sales, for discussion class purposes.



In the above diagram, we read through the question and substituted all info about material into the appropriate places in the diagram (see above). The 50 000 units produced and sold (also called actual output or actual production) is a "magic number" in standard costing – it is always applicable but students tend to omit it from SQ allowed x Actual Production x SP. This number stays the same for material, labour, overheads and sales.

The AQ is not complete when we substituted the 5kg into the diagram: 5kg is for one unit only, but we are dealing with 50 000. We therefore have an AQ of 5kg/unit x 50 000 units = 250 000 kg.

You will see that the info given in the question combines the SQ and SP into a standard cost of R24 per unit, so they have basically given us SQ x SP as R24 and we subsequently substitute R24 into the diagram where SQ x SP was used.

From the above diagram we can see that we do not have the actual price, the standard price or the purchase price variance. However, if you know your work you will know that purchase price variance + quantity variance = total variance. And we have been given the quantity variance and the total variance, so we can solve for the purchase price variance mathematically:

PPVar + QVar = Total Var
PPVar - 100 000 = 50 000
PPVar = +150 000
PPVar = 150 000 favourable

The reason why we subtract 100 000, is because the signs of the QVar and the Total variance in the question differ (the one is favourable and the other unfavourable). We can choose whether to assign a + to favourable and a – to unfavourable (or the other way around). For this explanation we assume that we chose to assign a + to favourable. The negative Qvar therefore has to get a – sign.

We can solve for the SP as this is the only part of the calculation of the given quantity variance that is still missing. Read from the table:

(5 x 50 000 x SP) – 1 200 000 = 100 000
250 000 SP = 1 300 000
SP = R5,20 per kg

We now also substitute SP = 5,20 into our diagram.

TL203 add. question 4

Calculation of standard price (SP) per kilogram:

(5 x 50 000 x SP) – (R1 200 000)	= R100 000
250 000 SP	= R1 300 000
SP	= R1 300 000^ / 250 000^
SP	= R5,20 per kg

Purchase price variance	= Total variance - quantity variance
	= R50 000 (f) – R100 000 (u)
	= R150 000 (f)^

Calculation of actual price (AP) per kilogram:

(5 x 50 000 x AP)^–(5 x 50 000 x 5,20)^	= -R150 000
250 000 AP – 1 300 000	= -R150 000
250 000 AP	= R1 150 000
AP	= R1 150 000 / 250 000^
AP	= R4,60 per kg

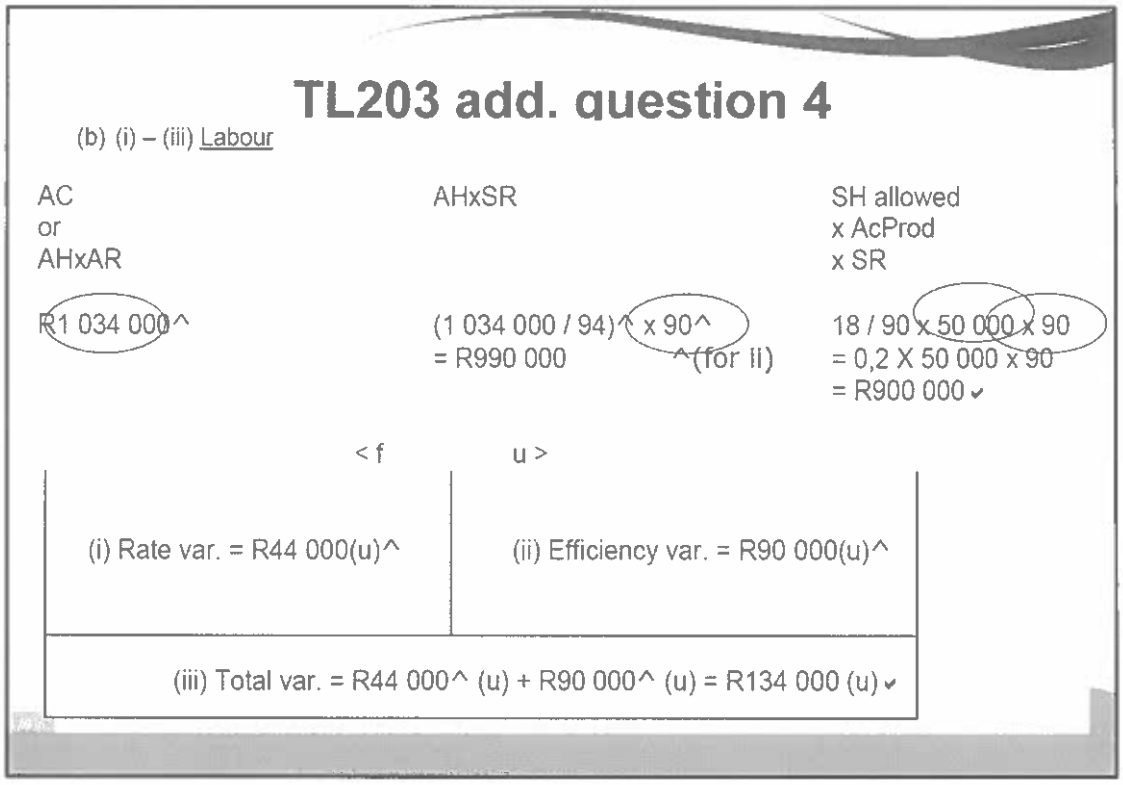
Now that we have calculated the purchase price variance and the SP, we can continue by calculating AP. Read from an updated diagram:

(5 x 50 000 x AP) – (5 x 50 000 x 5,20) = - 150 000

We use a negative 150 000 as the purchase price variance is favourable and the left-hand side (AQ x AP) therefore less than the right-hand side (AQ x SP). To illustrate this, assume the left-hand side was 5 and the right-hand side 10 (left < right). The variance would then be 5 – 10 = -5 and it would thus be R5 favourable.

250 000 AP = - 150 000 + 1 300 000
AP = 1 150 000 / 250 000
AP = R4,60

You can see that the R4,60 is more or less in line with the size of the R5,20 – one is not millions and the other only tens of rands. If the info in a standard costing question is realistic, huge differences between actual and standard could perhaps be an indication that you made a mistake somewhere.



I have circled all the info we originally have about labour in the question and would have put in the diagram first. The remainder of the info we will calculate. Assume they have asked for the labour rate and labour efficiency variances.

We were given the actual cost of R1 034 000. If you have actual cost, you will not always have to calculate all its comprising parts (AQ and AP) – sometimes AC is enough info to calculate what is required and can save you time.

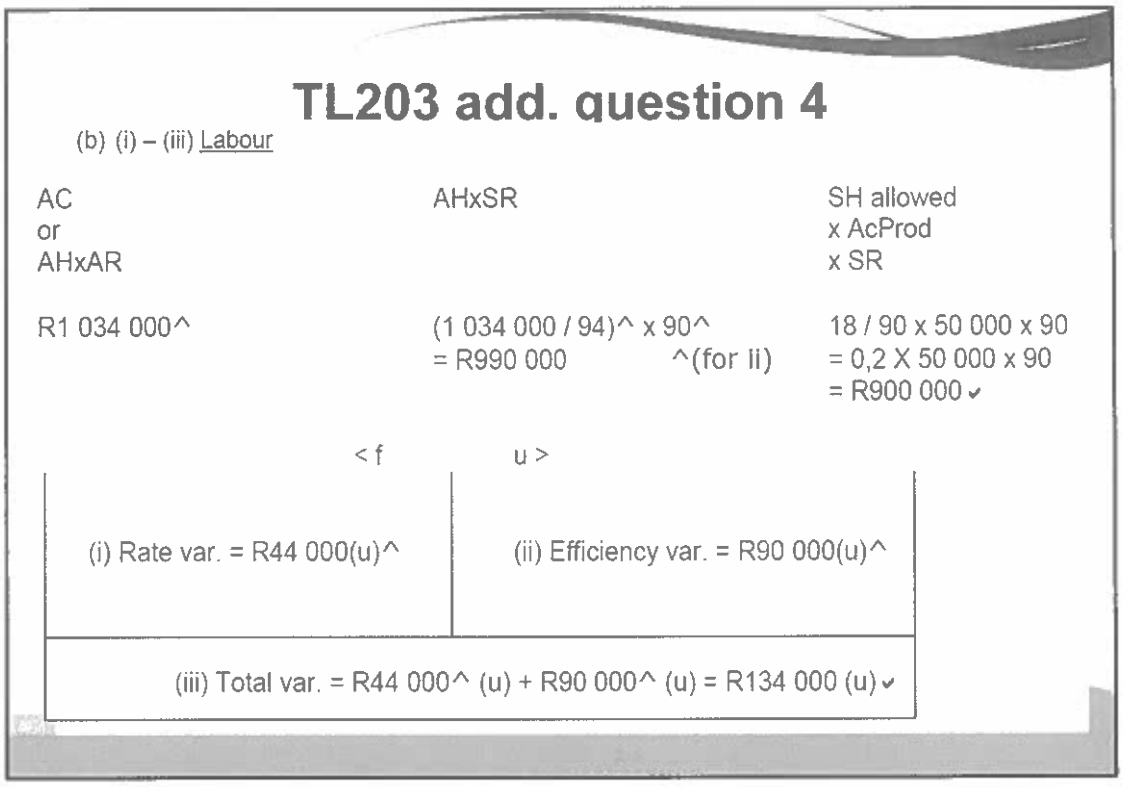
Keep in mind that in principle:

Cost/hour x Hours = Total cost

Therefore for one unit (standard):
R90 (given) x Hours per unit = R18 (given)
Hours per unit = 18/90 = 0,2
This is my standard hours (SH allowed).

Also, for actuals, in total:
R94 (given) x AH = R1 034 000 (given)
AH = 1 034 000 / 94 = 11 000 hours

We can substitute SH in the diagram by 0,2 and each AH by 11 000. Now we have sufficient info to calculate all the legs of our diagram:



All that is left is to calculate the rate and efficiency variances as:

Rate variance = 1 034 000 – 990 000 = R44 000 (u)
Efficiency variance = 990 000 – 900 000 = R90 000 (u)

And the total variance as:

Total variance = Rate variance + Efficiency variance
= 44 000 (u) + 90 000 (u)
= R134 000 (u)

or read from the table: 1 034 000 – 900 000 = R134 000 (u)

Do you see we get the same answers using both methods for calculating the total variance? You need to know both methods as the info provided sometimes forces you to use a specific one of the two methods.

TL203 add. question 4

(iv) – (v) Variable manufacturing overheads

AC or AHxAR	AHxSR	SH allowed x AcProd x SR
	< f u >	
R500 000^	1 034 000 / 94 x R10/(18/90) = 11 000^ x R50^ = 550 000 ^(for v)	18/90 x 50 000 x R50 = R500 000 ✓

(iv) Rate var. = R50 000 (f)^	(v) Efficiency var. = R50 000 (u)^
Total var.	

When overheads vary with hours worked, it means that it varies with my labour hours and therefore the AQ or AH for overheads will be the same as for labour. Therefore AQ for overheads (i.e. AH for overheads) will be 11 000 just like in our labour diagram. Also, my SH allowed (per unit) will also be 0,2 as with labour.

However, there will be a new actual rate and standard rate.

Again:

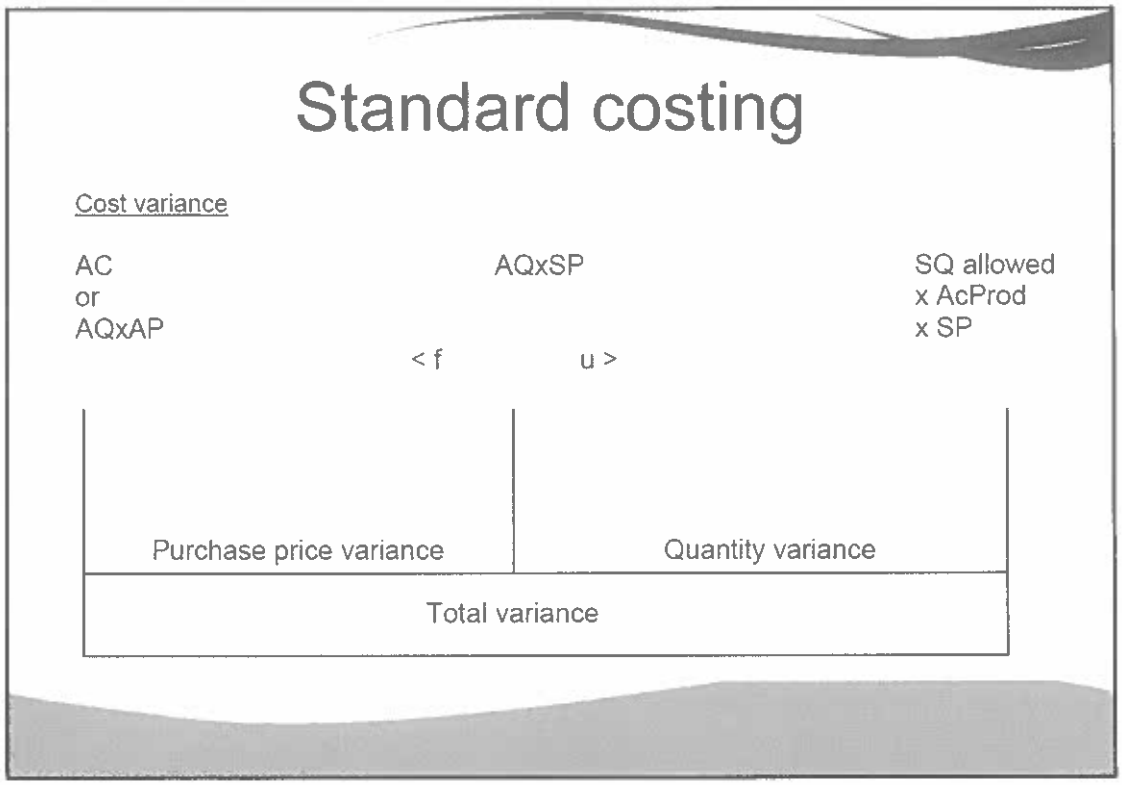
Cost/hour x Hours = Total cost

Therefore for one unit (standard):
Cost/hour x 0,2 = R10 (given)
Standard overhead rate (SR) = 10/0,2 = R50 per hour

We now have all the info to calculate the three legs:

AC = R500 000 (given)
AQ x SP = 11 000 x 50 = R550 000
SQ allowed x AcProd x SP = 0,2 x 50 000 x 50 = R500 000

Therefore:
Rate variance = 500 000 – 550 000 = R50 000 (f)
Efficiency variance = 550 000 – 500 000 = R50 000 (u)
Total variance = 500 000 – 500 000 = R0



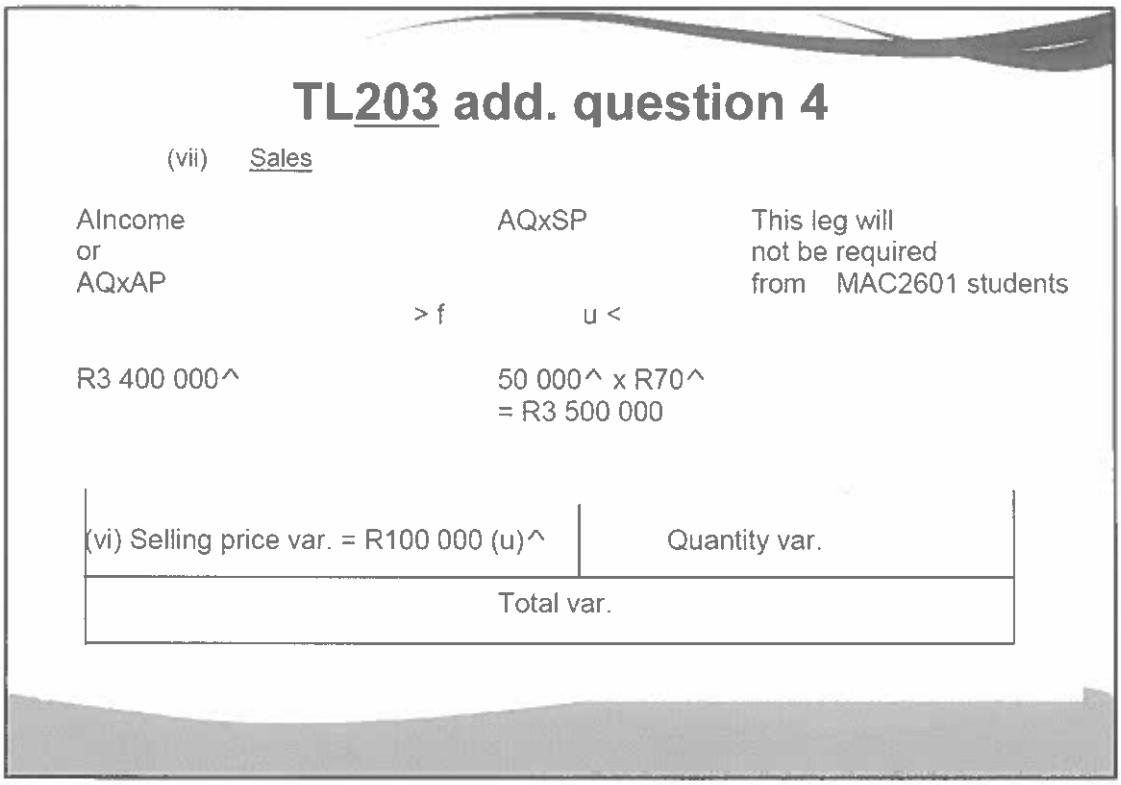
Let's assume our question did not state that overheads vary with hours worked, but with production. This means that I will have an overhead rate per UNIT produced.

We now do not have hours per unit anymore, but "units per unit". This sounds funny, but in actual fact simply means that one unit of production will use "one unit of production", which means that my SQ allowed will always be 1 if overheads vary with UNITS or PRODUCTION or UNITS PRODUCED.

AC would remain R500 000 (given) if overheads varied with production in our example question.
AQ x AP would be 50 000 units x R10 per unit = R500 000
SQ allowed x AcProd x SP would be 1 x 50 000 x 10 = R500 000

Rate variance: 500 000 – 500 000 = R0
Efficiency variance: 500 000 – 500 000 = R0
Total variance: 0 + 0 = R0

It was simply coincidental that our rate and total variance was R0. However, when overheads vary with production (NOT when it varies with hours!) my efficiency variance will always be R0. You can remember this and if you are comfortable not to do the calculation, simply show R0 if this variance is asked. You can read in the study guide of a few variances that will always be zero and simply write down 0 or R0 if any of these are asked (to save time). If you are not sure, you can do the calculation.



Remember that we said the f and u is different when it comes to sales. Don't forget that you are now working with an income and not a cost.

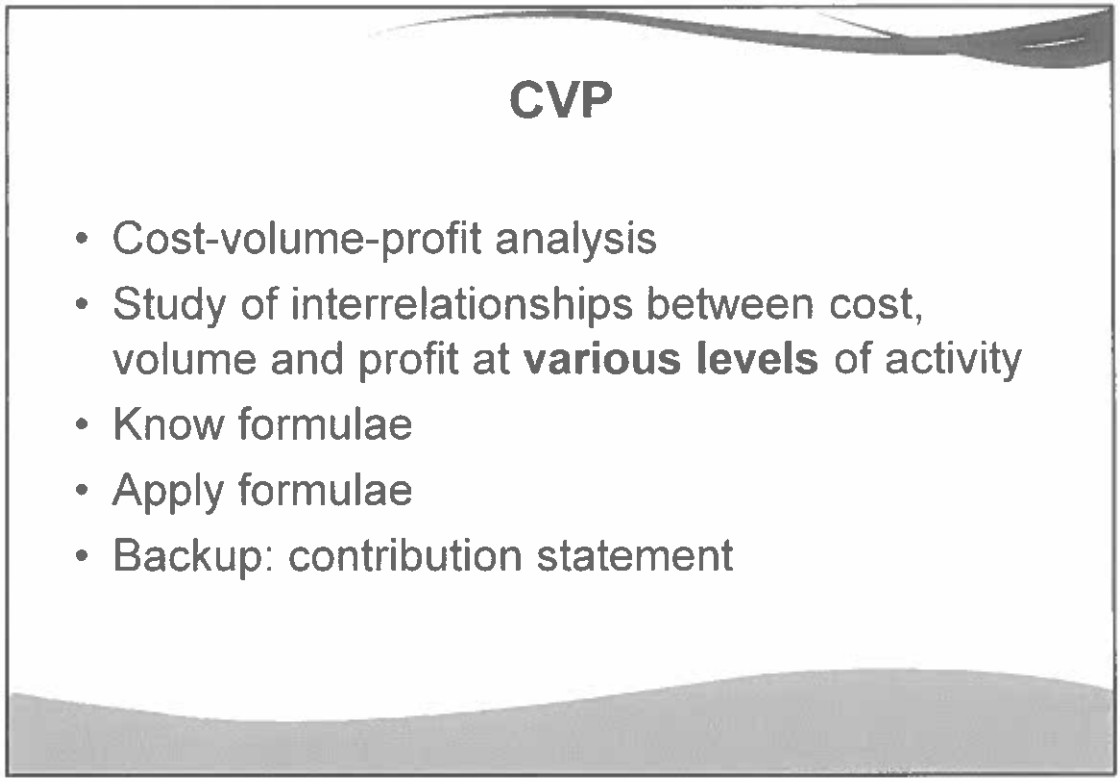
Assume they are asking for the selling price (or sales price) variance.

We were given actual income of R3 400 000.

We were given AQ (50 000 units) and SR (R70 per unit).

We can therefore calculate the variance even without calculating the AR in this scenario (unless AR was also required). From the diagram:

3 400 000 – 50 000 x 70 = 3 400 000 – 3 500 000 = R100 000 **(u)**



You need to know your CVP formulae by heart for MAC2601. In fact, you need to know all formulae in your study guides except for the two formulae of the simple regression analysis that will be given if you need to use them.

Make sure that you also know how to apply formulae: although you need to write down the formulae that you are using, there is no use in writing them down if you do not apply them (substitute and solve). Sometimes the formulae count half a mark each, but sometimes you do not get marks for them. But even when they do not count any marks, you need to write them down, as there are often several different formulae that can be used to get to the same answer and therefore the marker need to know which formula you are using in **your** calculations.

If you do forget any formulae, you can work backwards from the information that was given in the question to the required by making use of a direct costing SOCI format (S – VC = Contribution; Contribution – FC = Profit). Substitute everything you have into the SOCI and work "backwards" to what has been asked.

CVP

TL203 add. question 6 (given):

MAC2601/203

QUESTION 6 – SENSITIVITY ANALYSIS (20 marks) (24 minutes)

Huge Concerts (Pty) Ltd is a South African based company in the entertainment sector based in Rosebank, Johannesburg. The main activity of the company is to invite famous and mostly Grammy award winning artists to perform in South Africa. When the artists are in South Africa they usually perform in the large South African cities of Johannesburg, Cape Town and Durban.

Huge Concerts have been pondering over the decision to bring a well known American artist to the South African shores for some time. The company took a firm decision to invite in November 2013 an American artist called Sianna. The CEO of Huge Concerts is excited about Sianna coming to South Africa and even boasted to a friend about it.

Huge Concerts (Pty) Ltd requested you to assist them with cost volume profit and profitability analysis.

A cost volume table was also prepared and you are provided with the following cost structure for Huge Concerts (Pty) Ltd for the 2013 months listed below:

Month	Cost	Tickets sold
May	R120 000	20 000
June	R150 000	30 000
July	R140 000	26 000
August	R 90 000	15 000
September	R100 000	18 000
October	R130 000	25 000

Variable costs consist of the cost of a pack that revellers at the concert will be provided with at the entrance of the venue. The pack includes a bottle of wine and a snack. The proposed selling price of a ticket is R35.

The first question requires that we calculate the breakeven point in units. A formula that we can use, is Fixed cost / Contribution per unit. However, we were not given the fixed costs (directly), neither do we have sales and VC or contribution.

If you get information about a cost for different periods (two or more), consider whether you are not dealing with a semi-variable cost that will have to be split into its variable and fixed portions by means of the high-low-method. The high-low-method is important throughout your cost accounting modules.

To test whether the cost in our example question is semi-variable, you can divide the cost by the number of units on a monthly basis. If the cost is clearly not simply fixed and the cost per unit differs from period to period and it was not because of a price increase/decrease, you know you are dealing with a semi-variable cost

For May: cost per unit = 120 000 / 20 000 = R6
For June: cost per unit = 150 000 / 30 000 = R5

We don't even have to continue with the other months – we clearly have a semi-variable cost here.

We will have to split the semi-variable costs to get the FC and the VC.

$$\frac{\text{Cost at highest activity level} - \text{Cost at lowest activity level}}{\text{Highest activity level} - \text{Lowest activity level}}$$

= (R150 000 – R90 000) / (30 000 – 15 000)
= R60 000 / 15 000 units
= R4 per unit

This is the variable cost per unit. Now we can continue by calculating the FC in total per month and the VC per unit as per the slides. Then we substitute these into our formulae and solve for the breakeven units. We round UP breakeven units that are not integers, as we cannot sell parts of units and if we round down, we will not be selling enough to break even (we will also round UP when we calculate the number of units to be sold to achieve a target profit, as we have to reach **at least** the desired profit level and not less than it).

CVP

TL203 add. question 6 (asked):

REQUIRED

The Chief Executive Officer of Huge Concerts has requested you to calculate the following:

1. The number of tickets that Huge Concerts have to sell in order to break even. (7)
2. How many tickets have to be sold to earn R20 000 target profit. (3)
3. What profit will result if 3 000 tickets are sold. (3)
4. What selling price must be charged to show a profit of R40 000 on the sale of 3 000 tickets. (4)
5. How many additional tickets have to be sold to cover R10 000 additional fixed costs of billboard advertisements next to the M2 highway and still break even (assume selling price of R35). (3)

See if you can answer the above as you would in an exam. Show your formula, substitute and solve.

The answers are in the slides. You could have used different formulae to get to the same answers. You need to show all your workings.

CVP

1. Number of tickets to break even (using High-Low-method as well as formula):

Month	Cost	Activity
June	R150 000	30 000 √
August	R 90 000	15 000 √
Difference	R 60 000	15 000

R60 000 divided by 15 000 = R4 per unit √
Variable cost = R4 per unit

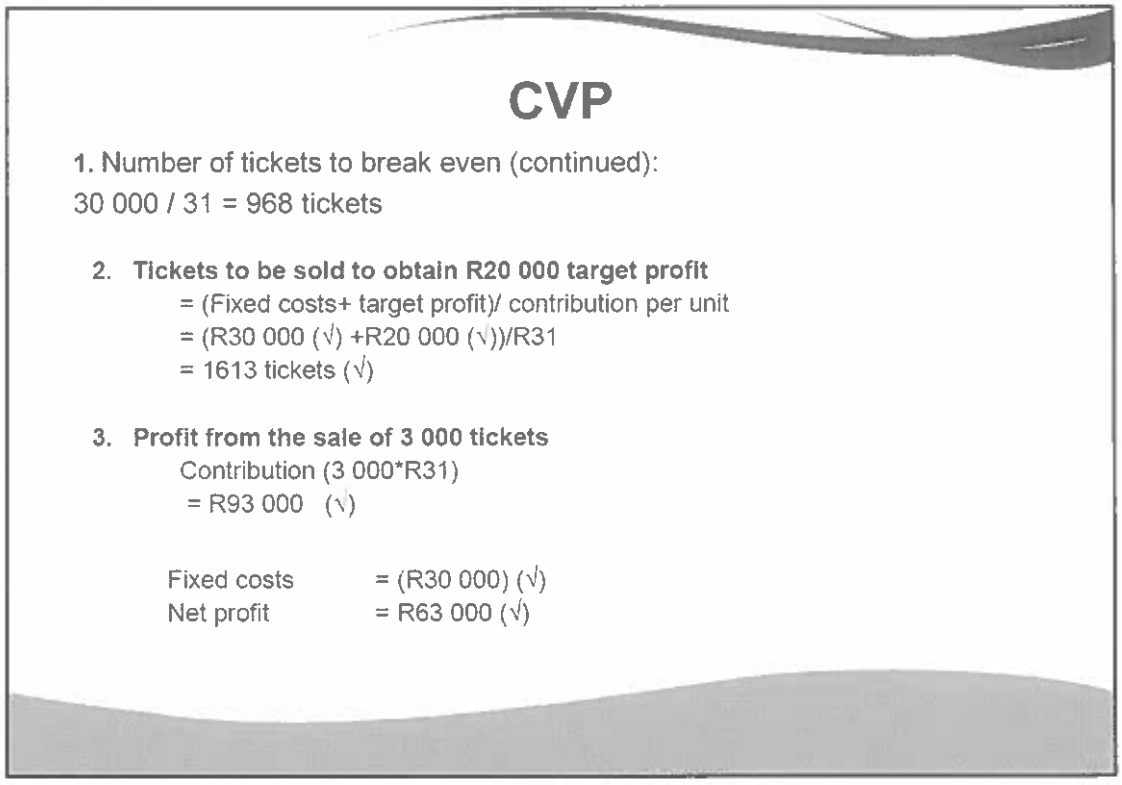
Fixed costs = R150 000 – (30 000*R4) √
= R30 000

Contribution per ticket
Selling price =R35
Variable cost = (R4)

Contribution per unit = R31 √

Breakeven point in units= Fixed costs/ contribution per unit

We have already discussed the bulk of the first sub-question. Note that the selling price per unit was given and we calculated the variable cost per unit by means of the high-low-method, so now we have enough info to calculate the contribution per unit that we will substitute into the breakeven units formula.



Sub-question 3: Can you see that we saved time by immediately starting with the contribution for 3 000 tickets instead of calculating sales and then variable costs and then only the contribution? This is because we know what the contribution per unit (R31) is (we have calculated it before and there was no indication in the question that it has changed).

4. **What selling price have to be charged to show profit of R40 000 on sale of 3 000 tickets**

Total Revenue	= R82 000 (√)
Variable costs (3 000* R4)	= R12 000 (√)
Fixed costs	= R30 000 (√)
Target profit	= R40 000 (√)

Sales Revenue/ tickets to be sold= R82 000/3 000 tickets= R27,33

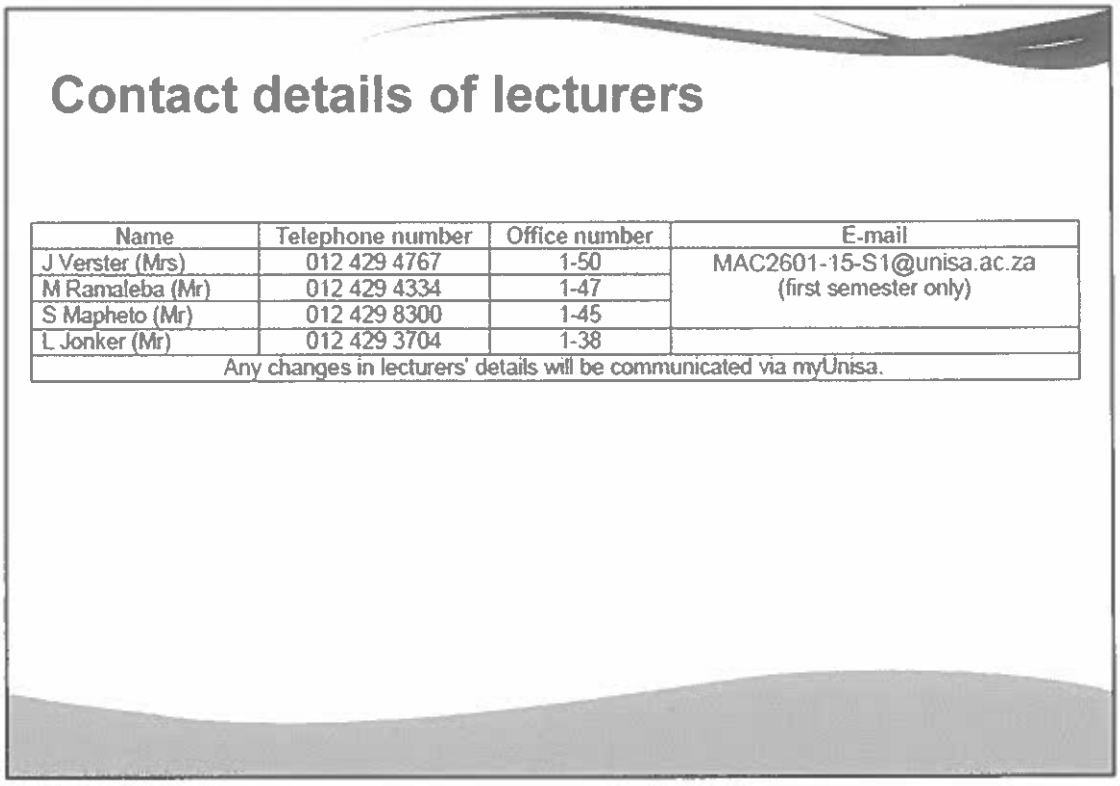
5. **How many additional tickets have to be sold to cover R10 000 additional fixed costs of billboard advertisements next to the M2 highway and still break even (SP = R35)**

Additional fixed costs: R10 000(√) / R31 (√) contribution per unit= 323 tickets (√)

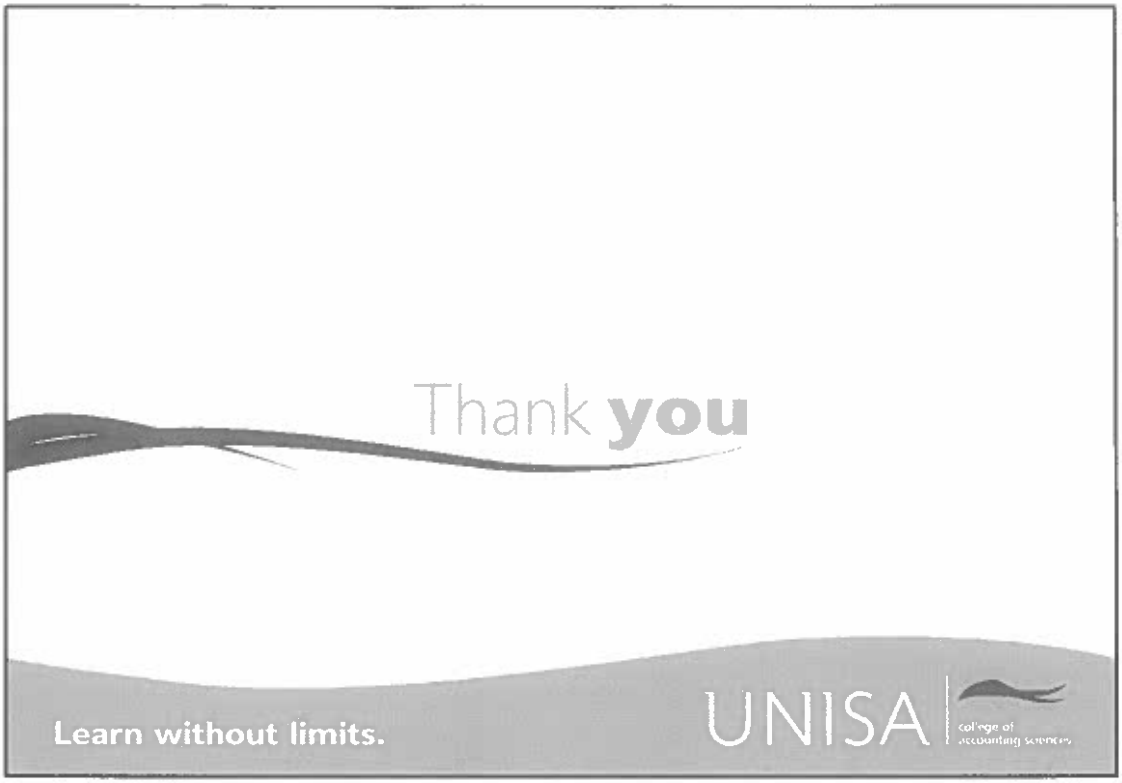
Alternative answer:

R40 000 divided by R31 = 1 291 tickets
Additional tickets= 1 291 - 968 = 323 tickets
(R40 000 = R30 000 + R10 000)

More calculations. If you do not agree or understand, please contact the lecturers.



The current details of the lecturers of MAC2601. If the details change, we will communicate this via myUnisa. The average turnaround time of an e-mail enquiry is two working days.


Thank you
Learn without limits.
UNISA