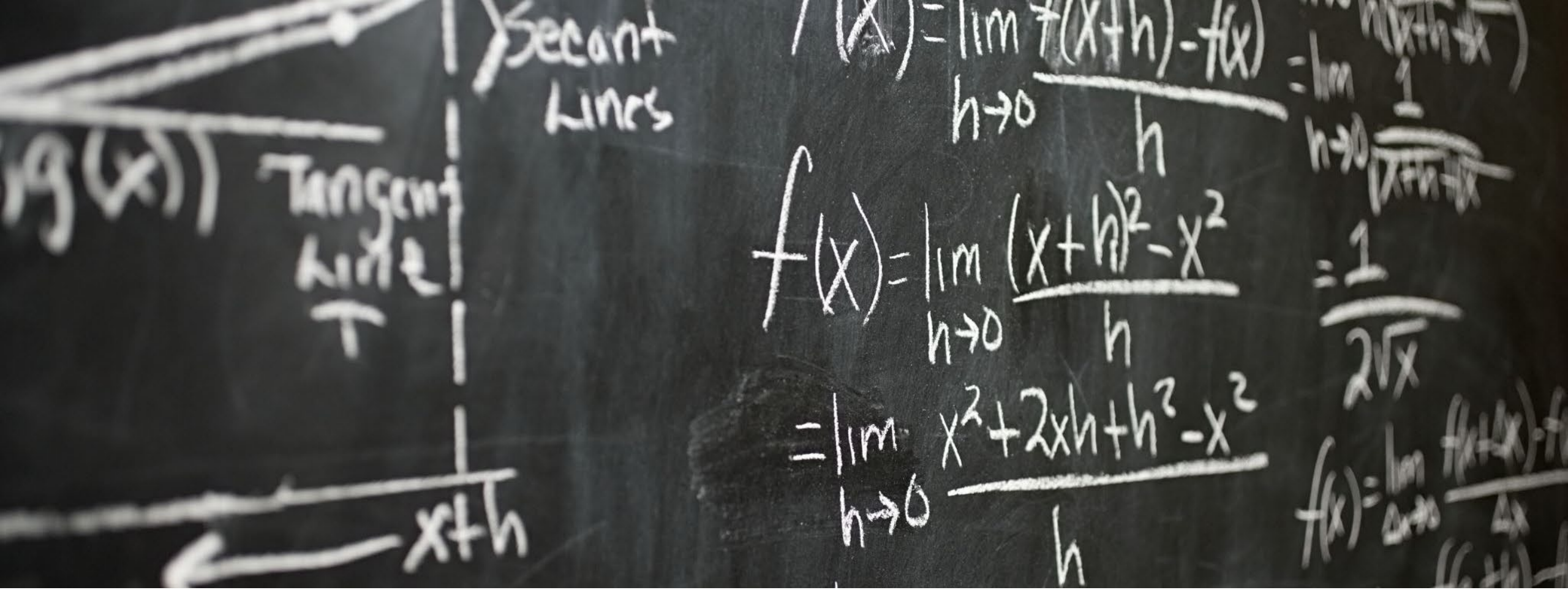
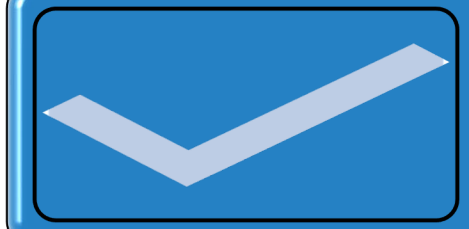


Processes and Handy Tips

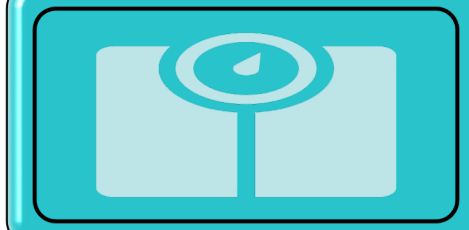
Lecturer: Mark Gillan

Starting and layout



Ensure everything is in the correct units for the task in hand.

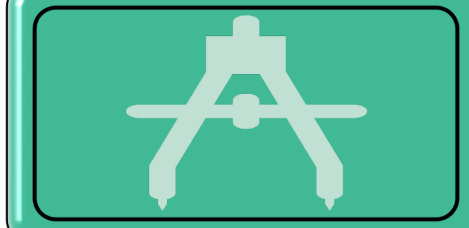
If a formula needs weight in Kg or height in metres or currency in Pounds Sterling ... Convert!



Calculations need step by step sections with plenty of space to view.

Using headings alongside the step number. For example, ‘Step 1: Convert into Kg’

Maybe think about separating each step with a squiggly line and then a straight line at the end of everything.



Check your calculations.

If using step-by-step headings and breaking up the processes into smaller calculations, it means if you make a mistake, you only have to correct from that mistake onwards instead of everything all over again.

Hints and Tips

Do use a nice layout, spacing out each section of calculations for easy reading and ease of checking. Label everything, so you know what you have done.

Remember all topics covered

More than one topic can be used at any one time. In other words, questions can require use of more than one topic, sometimes many topics together.

Processes provide answers. Rome wasn't built in a day, it took time.
Split things down into manageable chunks, don't try everything all at once!

Processes

When confronted with a lot of words, extract the main information.

Obtain the mathematical requirements from the question.

Write everything down in a list.

Work your way through the process, starting with converting into the correct unit required.

Look at the example on the next page...

Example

Alberta works for a laboratory manufacturing and testing paint reactions between different metals, woods, plastics. Alberta works in a large building with lots of colleagues.

Alberta is contracted to a 35-hour week, Monday to Friday. During the week, shifts can mean 2 hours overtime per day and is paid at time and a quarter above the basic rate.

Saturday working is overtime for all hours worked that day, paid at time and a half.

Sunday working is overtime for all hours worked that day, paid at double the Saturday rate.

Last week, if Alberta works 1 hour overtime Monday, 2 hours overtime Tuesday, 3 hours overtime Thursday and 2 hours overtime Friday, 4 hours overtime Saturday, 3 hours overtime Sunday, noting the basic rate of pay is normally £19.78 per hour. How much gross pay does Alberta earn for last week?

A piece at a time – extract information

Alberta works for a laboratory manufacturing and testing paint reactions between different metals, woods, plastics. Alberta works in a large building with lots of colleagues.

Alberta is contracted to a 35-hour week, Monday to Friday. During the week, shifts can mean 2 hours overtime per day and is paid at time and a quarter above the basic rate.

Saturday working is overtime for all hours worked that day, paid at time and a half.

Sunday working is overtime for all hours worked that day, paid at double the Saturday rate.

The first paragraph doesn't matter to our calculations at all.

Tells us Monday to Friday is paid at time and a third for overtime, being 1¼ x basic rate.

Saturday is time and a half, being 1½ x basic rate.

Sunday is double the Saturday rate.

Note the rates of pay

Monday to Friday is paid at time and a quarter for overtime, being 1¼ x basic rate.

Saturday is time and a half, being 1½ x basic rate.

Sunday is double the Saturday rate.

Last week, if Alberta works 1 hour overtime Monday, 2 hours overtime Tuesday, 3 hours overtime Thursday and 2 hours overtime Friday, 4 hours overtime Saturday, 3 hours overtime Sunday, noting the **basic rate of pay is normally £19.25 per hour**. How much gross pay does Alberta earn for last week?

Basic rate of pay is £ 19.78 per hour

Remember, converting fraction to decimal...

Divide the top by the bottom.

Overtime Mon-Fri is 19.78 x 1.25 = 24.725
Rounded off is £24.73 per overtime hour.

Overtime Saturday is 19.78 x 1.5 = £29.67

Overtime Sunday is Sat £29.67 x 2 = £59.34

Hours worked x rate

35-hour week basic

Basic rate of pay is £ 19.78 per hour	35 x 19.78 = 692.30
Mon-Fri overtime 1 + 2 + 3 + 2 = 8 hours	
Overtime Mon-Fri is £24.73 per overtime hour	8 x 24.73 = 197.84
Saturday overtime of 4 hours	
Overtime Saturday is £29.67	4 x 29.67 = 118.68
Sunday overtime of 3 hours	
Overtime Sunday is £59.34	3 x 59.34 = 178.02
	GRAND TOTAL of all added up: **£1,186.84**

Process

When confronted with a lot of words, extract the main information.

Obtain the mathematical requirements from the question.

Write everything down in a list – clearly mark everything with a note of what it is or does.

Work your way through the process, starting with converting into the correct unit required.

Use your knowledge of topics and mathematical tools

Tips

Handy tips for you

Penny Tip … Half penny tip

We don’t have physical halfpenny pieces anymore

But we can still calculate parts of pennies

Example, 8.5 pence is 8 and half pennies

Example, 4.2745 pence is 4 pence with parts thereof

Write it down as pence in Pounds and Pence

8.5 pence would be £0.085

4.2745 pence would be £0.042745

Zero pounds, zero tens

10 pence would be £0.10

10.5 pence would be £0.105

Tip – decimal places / significant figures

DECIMAL PLACES

Amount of numbers after the decimal place.

Rounded off using the usual rule of 5 or above.

Example:

14.1283 to 2 decimal places is 14.13

SIGNIFICANT FIGURES

We round things off to significant figures all the time.

Example:

Winning the lottery of 15,540,312 big lolly notes would usually be rounded off to either 2 significant figures of 15 million or 3 s.f. of about 15.5 million.

Tip – A power tip!

Mathematics uses wee numbers at the top right hand of a number to place emphasis upon the size of the overall number.

Example: 2^{5}

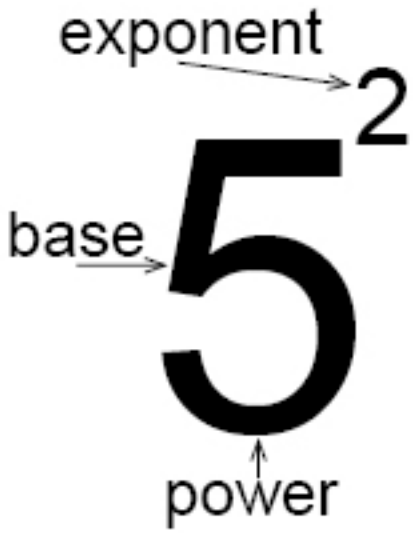
Means: 2 to the power of 5 being the number multiplied by itself to the total times stated by the number.

The 2 is the base number being multiplied by the exponent of 5 (being the base number multiplied by itself the number of times indicated by the exponent)

So, in this instance it would be:

2 x 2 x 2 x 2 x 2 = 32

It is NOT the number multiplied by the other number; it is ‘to the power of’



Tips for Charts and Graphs

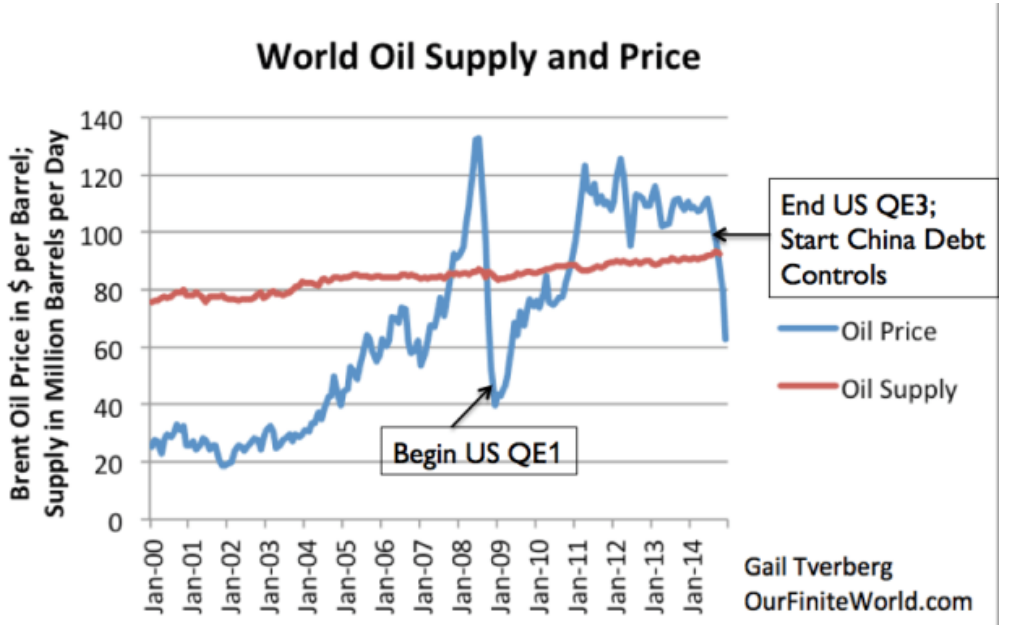
Must have a title

X-axis along the bottom with title

Y-axis at the left-hand side with title

Correct chart for the job

Legend and labels



Do NOT forget for Percentages

$$\frac{\text{Difference or Change}}{\text{Original or total to calculate}} \times 100 = \text{Difference or Change as a Percentage}$$

Percentages

Percentage increase or decrease...

Multiply a percentage value by the amount to increase or decrease by that percentage amount.

Amount from a percentage value...

Multiply an amount by the percentage value.
For example, to find out 20% of 449
Multiply. 449 x 0.2
For example, to find out 4% of 38,911
Multiply. 38,911 x 0.04

Remember, a percentage is an amount per 100 and therefore can be shown as a fraction over 100 and then the usual to convert a fraction into decimal to use as above.

Change or difference as a percentage

Whenever working out an amount as a percentage, always remember the formula.

Remembering the formula will keep you right forever!

For example, if wee Andy has a salary of £48,500 and gets a pay rise of £2,350
This can be calculated out to a percentage amount by using the formula...

Change divided by the original x 100

In the example, it would be 2350 being the change / the difference. Original amount is the 48500
Therefore, 2350 divided by 48500 ... Then x 100

REMEMBER REMEMBER

CHANGE or DIFFERENCE

Divided by

ORIGINAL AMOUNT

X 100

And again!

Revise all topics for understanding

Revision of all topics

Use the notes

View the video tutorials

Try all exercises

Practice

Look back over notes and tutorials

Make your own notes with processes

Check your answers

Verify against answers I provide to you

Can’t emphasise enough …

Study, study, study!

Revise, revise, revise!

Notes

Video Tutorials

Exercises

Review answers