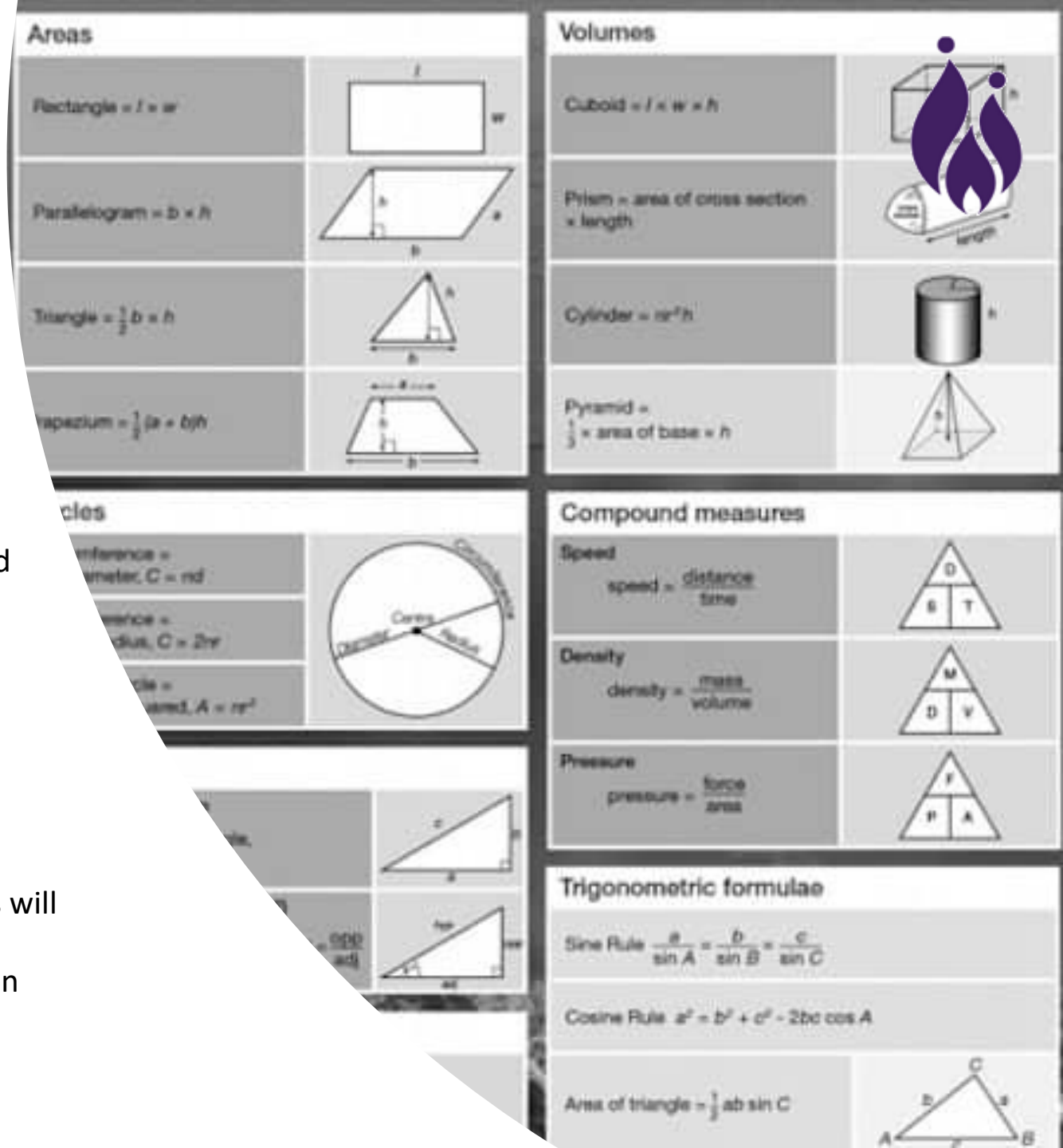
# Mathematics at King's School

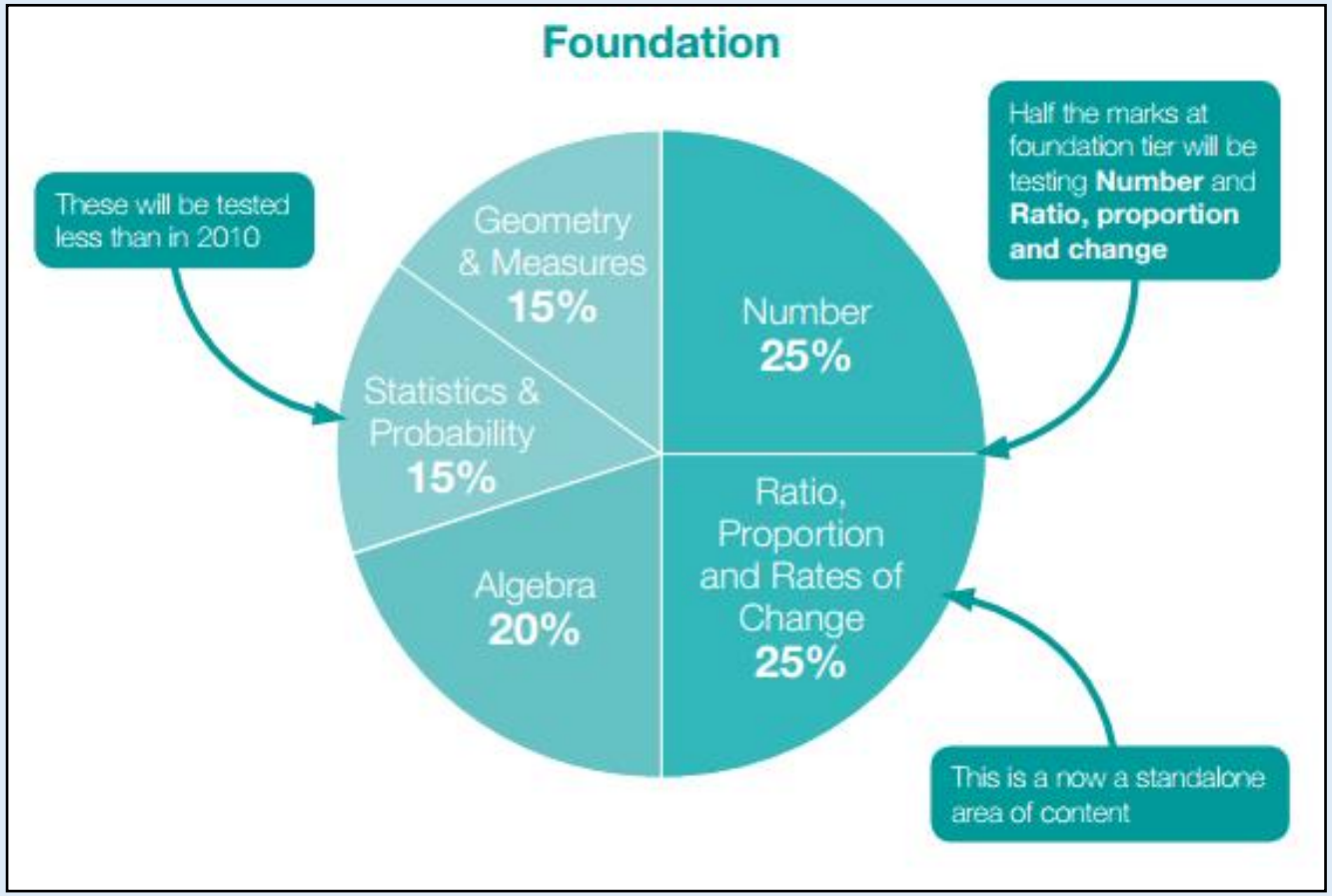
# GCSEs – What you need to know

**Teaching from 2015, Tested from 2017:**

- Students at Kings will study the **Edexcel** maths course (**1MA1**)
- Mathematics will remain split between higher (grades 5-9) and foundation (grades 1 – 5).
- Students in 10M1 to 10M4 will be following the higher GCSE. Students in 10M5 and 10M6 are mixed ability groups and are following the Foundation GCSE
- Each student will now sit three 90 minute exams. (1 NC, 2 C)
- There will be a greater emphasis on problem solving and mathematical reasoning, with more marks allocated to these skills.
- Students will be required to **memorise more formulae**, as less will be provided in the exam
- Harder topics will be introduced into the higher and foundation exams.



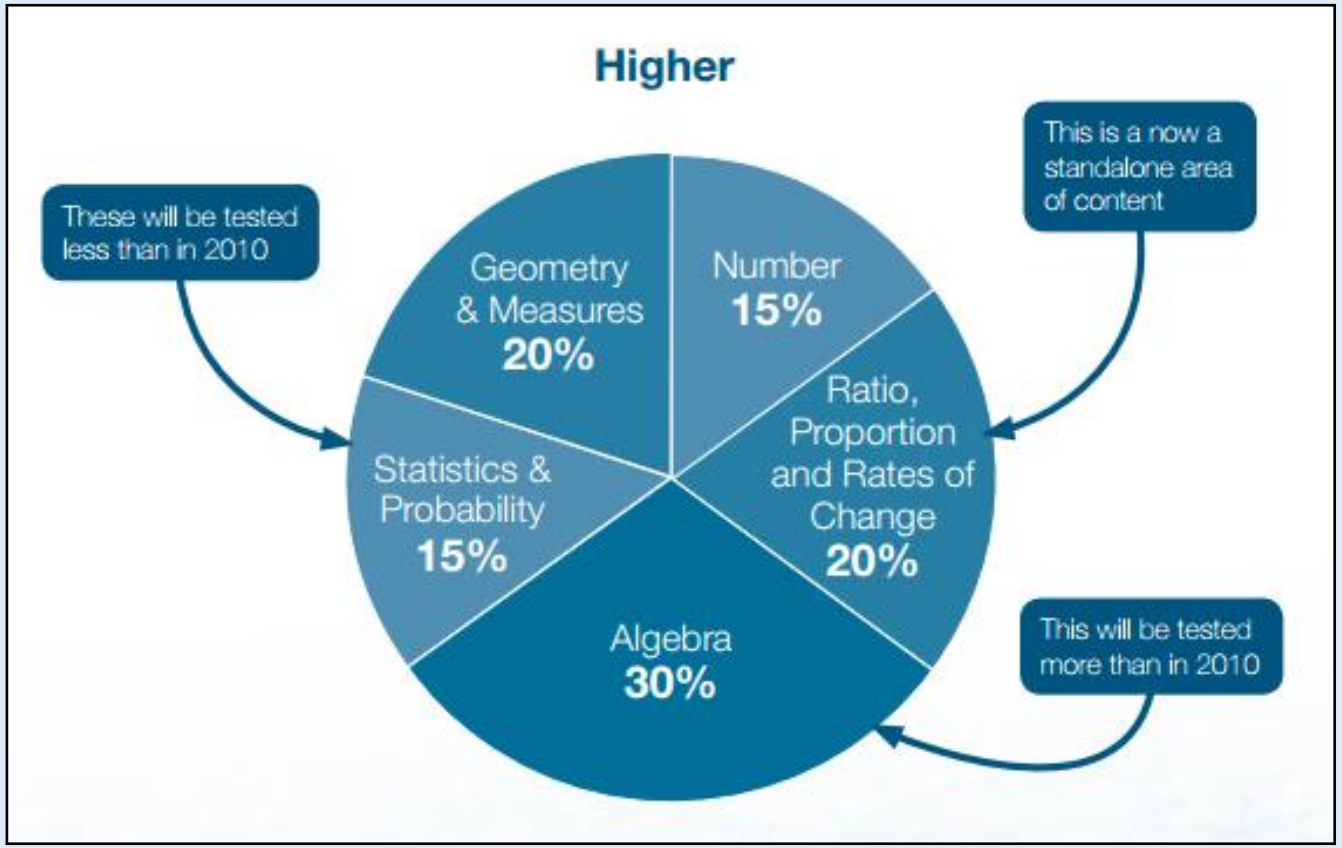
# Foundation Content




## Topics new to Foundation tier (previously Higher tier only in 2010)

- Index laws: zero and negative powers (numeric and algebraic)
- Standard form
- Compound interest and reverse percentages
- Direct and indirect proportion (numeric and algebraic)
- Expand the product of two linear expressions
- Factorise quadratic expressions in the form $x^2 + bx + c$
- Solve linear/linear simultaneous equations
- Solve quadratic equations by factorisation
- Plot cubic and reciprocal graphs, recognise quadratic and cubic graphs
- Trigonometric ratios in 2D right-angled triangles
- Fractional scale enlargements in transformations
- Lengths of arcs and areas of sectors of circles
- Mensuration problems
- Vectors (**except** geometric problems/proofs)
- Density
- Tree diagrams

# Higher Content




## Topics new to Higher tier

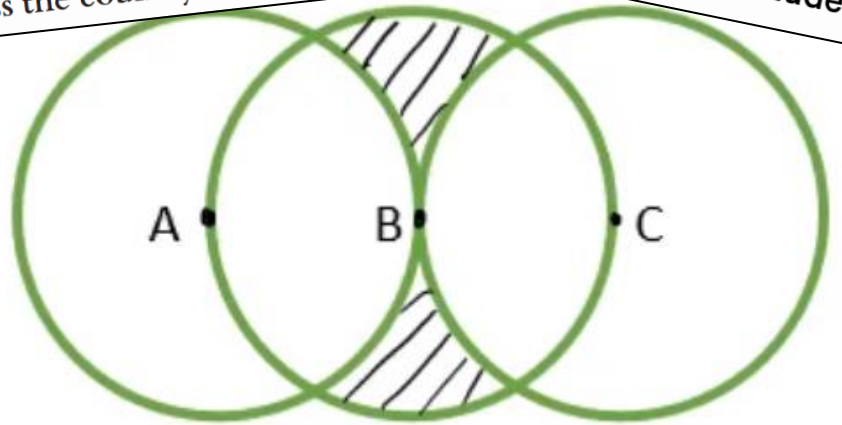
- Expand the products of more than two binomials
- Interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function' (using formal function notation)
- Deduce turning points by completing the square
- Calculate or estimate gradients of graphs and areas under graphs, and interpret results in real-life cases (**not** including calculus)
- Simple geometric progressions including surds, and other sequences
- Deduce expressions to calculate the nth term of quadratic sequences
- Calculate and interpret conditional probabilities through Venn diagrams

# Preparing for the challenge questions

- New specification has more focus on the A03 topics. These are what we might call wordy questions or questions that involve multiple topics.
- Students are exposed to these types of questions regularly in class and as part of their homework and learn how to gain marks for the trickiest of questions.

'Impossible' question on Maths GCSE exam stumps 16-year-olds across the country

Can you answer this math question that stumped GCSE students?




**AB=BC=4, Find shaded region**

In a shop, a TV has a normal price of £500
The shop has a sale.

On Monday, the normal price of the TV is reduced by $\frac{1}{10}$ to give the sale price.

On Tuesday, the sale price of the TV is reduced by 20%

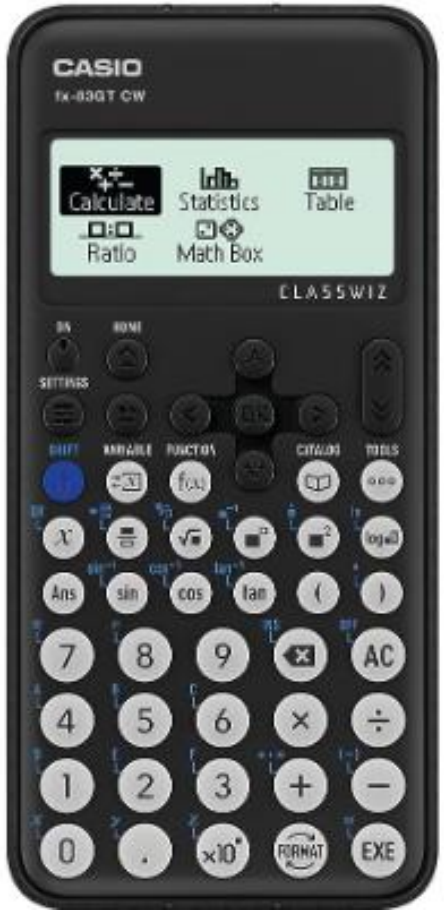
Chris wants to buy the TV.
He has £400 to spend on the TV.

Does Chris have enough money to buy the TV on Tuesday?
You must show how you get your answer.

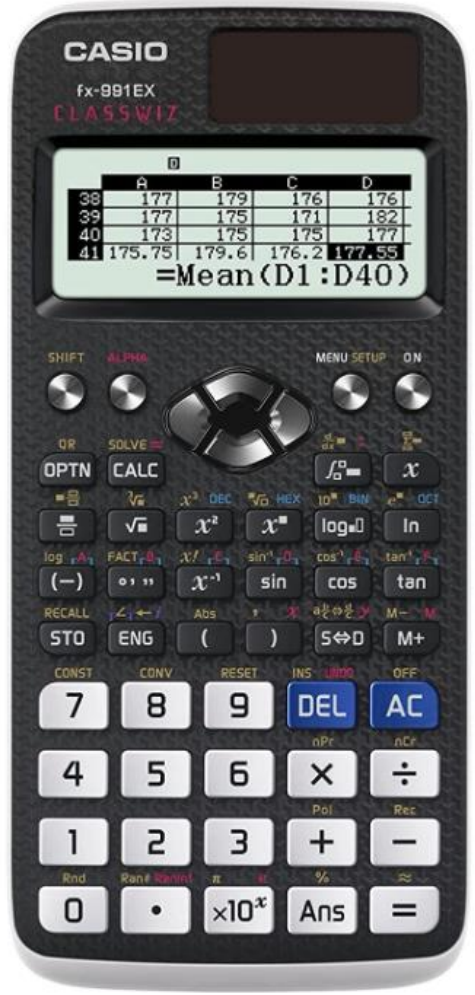
# Schemes of work & learning mathematics

- Scheme of work for year 11 builds upon KS3 and year 10 content.
- Students are generally taught mathematics through the practice of a worked example followed by a ‘your turn’ task.
- Students are encouraged to copy down examples and key notes.
- Students need to ensure they attend lessons with the correct equipment for the learning.

Casio FX-83GTCW
≈£12
Updated version of the previous Casio that most supermarkets sell. Good for foundation and higher




**CASIO FX-991EX**
≈£25
Good for students considering maths at A-Level



# KS4 Curriculum Guide - Year 11 Maths (Higher)

**Term 1** **Surds, Pythagoras and Trigonometry, Constructions and Loci, Vectors, Circle Theorems**

Simplifying surds and rationalising the denominator of a fraction. Pythagoras' Theorem in 2D and 3D. Trigonometric ratios: SOHCAHTOA Exact trig values of sin, cos and tan of 30, 45 and 60 degrees. The Sine and Cosine rules. Area of a triangle = 1/2ab SinC Using Pythagoras' Theorem and trigonometry to solve 2D and 3D problems. Ruler and compass constructions Solving problems involving loci Vectors and vector proofs. Circle theorems.

Assessment: Test on: Circle theorems, constructions & loci, Working in 3D. Pythagoras' Theorem, trigonometry and vectors Key Words and Terms

**Term 2** **Calculations 2 (reciprocals, rules of indices and standard form), Graphs 1, Simultaneous Equations**

The gradient of a straight line. The equation of a straight line, y=mx+c. Parallel and perpendicular lines. Solving simultaneous equations. Plotting quadratic functions, including roots and turning points. Completing the square. Representing inequalities on a number line, representing inequalities as regions and solving quadratic inequalities. Distance-time graphs. Velocity-time graphs. Reciprocals. Rules of indices. Fractional and negative indices. Exact calculations. Standard form.

Assessment: GCSE Mock 1 Exam on all topics weeks beginning tbc. Paper 1(non-calculator) Paper 2(Calculator) Paper 3(Calculator) Key Words and Terms

# Examination schedule & QLA's

https://screenrec.com/share/FIRhdmGbQe

**Student:**

| Question Number | Topic | DrFrostMath Clip | Marks available | Marks Achieved |
|---|---|---|---|---|
| 1 | Volume of cuboid/prism | | 4 | 4 |
| 2 | Calculating with standard form | K446, K447 | 3 | 2 |
| 3 | Algebraic fractions | K408 | 3 | 3 |
| 4 | Volume of cylinder | K316 | 3 | |
| 5 | Bounds | K454 | 2 | 2 |
| 6 | Volume of cuboid problem | | 3 | 3 |
| 7 | Manipulating formulae | K360, k363 | 2 | 1 |
| 8 | Volume with algebra | | 3 | 1 |
| 9 | Rates of flow | E196 | 5 | 0 |
| 10 | Area of a triangle and Pythagoras | K511 | 4 | 1 |
| 11 | Hidden Pythagoras | K509 | 4 | 0 |
| 12 | Speed distance time | | 4 | 2 |
| 13 | Exponential graph | K613 | 4 | 3 |
| | Draw and interpret a cumulative frequency graph | K557 | 5 | 2 |
| | TOTAL | | 49 | 28 |

**QLA will be emailed home:**
After term 1 – term 4 exam (unit test)
After the year 10 Exam in term 5 (Summative test)

**Areas for development:**
Topics in red should be revisited by students as part of a good revision strategy.
DrFrostMaths reference numbers are included.

Menu

dfm

King's School

Trophies 0/37

Mastered 0/588

Points This Year 0

## What to work on next?

| Question Number | Topic | DrFrostMath Clip | Marks available | Marks Achieved |
|---|---|---|---|---|
| 1 | Volume of cuboid/prism | | 4 | 4 |
| 2 | Calculating with standard form | K446, K447 | 3 | 2 |
| 3 | Algebraic fractions | K408 | 3 | 3 |
| 4 | Volume of cylinder | K316 | 3 | |
| 5 | Bounds | K454 | 2 | 2 |
| 6 | Volume of cuboid problem | | 3 | 3 |
| 7 | Manipulating formulae | K360, k363 | 2 | 1 |
| 8 | Volume with algebra | | 3 | 1 |
| 9 | Rates of flow | E196 | | 0 |
| 10 | Area of a triangle an Pythagoras | K511 | | 1 |
| 11 | Hidden Pythagoras | K509 | 4 | 0 |
| 12 | Speed distance time | | 4 | 2 |
| 13 | Exponential graph | K613 | 4 | 3 |
| | Draw and interpret a cumulative frequency graph | K557 | 5 | 2 |
| | TOTAL | | 49 | 28 |

Paper 3 - Topics in your GCSE - Complete

Set by Mr K Knowles

Review All

YOUR COURSES

Year 11 (Foundation) Edexcel 2022 Foundation P1-3

+Add Course

## Resources

- Questions & Past Papers
- Downloadables
- Virtual Whiteboard
- DFM Live!

## Notifications

You have been set a task by your teacher Mr K Knowles. Click to start it.
5 MONTHS AGO
Exam type questions - GCSE practice. (this is for all papers)

You have been set a task by your teacher Mr K Knowles. Click to start it.
5 MONTHS AGO
Paper 2 - Topics in your GCSE - Complete

You have been set a task by your teacher Mr K Knowles. Click to start it.
5 MONTHS AGO
Paper 3 - Topics in your GCSE - Complete

You have been set a task by your teacher Mr K Knowles. Click to start it.
6 MONTHS AGO
Paper 1 topics - GCSE

You have been set a task by your teacher Mr K Knowles. Click to start it.
6 MONTHS AGO
GCSE Countdown - Algebra Key skills

# Other sites & resources