

# Mathematics at King's School



# GCSEs – What you need to know

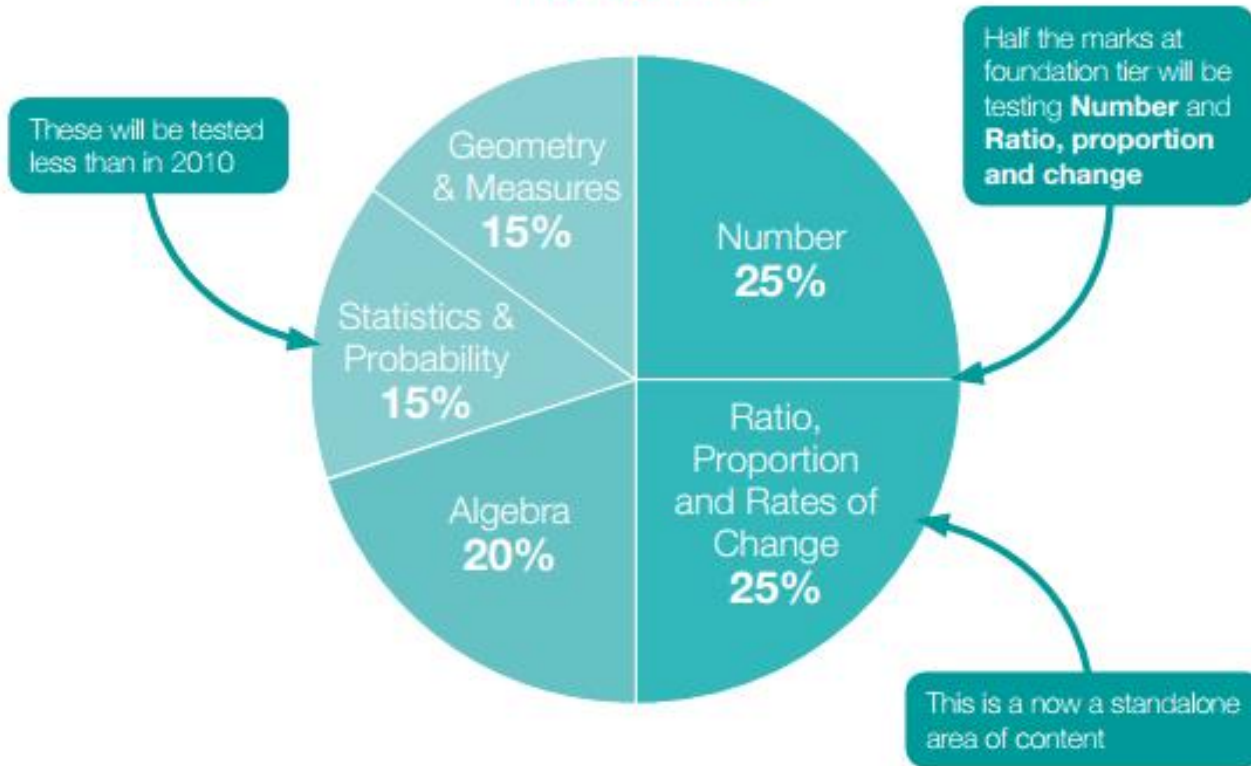
Teaching from 2015, Tested from 2017:

- Students at Kings will study the **Edexcel** maths course (**1MA1**)
- Mathematics will remain split between higher (grades 5-9) and foundation (grades 1 – 5)
- 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.

Areas		Volumes	
Rectangle = $l \times w$		Cuboid = $l \times w \times h$	
Parallelogram = $b \times h$		Prism = area of cross section $\times$ length	
Triangle = $\frac{1}{2} b \times h$		Cylinder = $\pi r^2 h$	
Trapezium = $\frac{1}{2} (a + b) h$		Pyramid = $\frac{1}{3} \times$ area of base $\times h$	
Circles		Compound measures	
Circumference = $2\pi r$		Speed speed = $\frac{\text{distance}}{\text{time}}$	
Area of circle = $\pi r^2$		Density density = $\frac{\text{mass}}{\text{volume}}$	
		Pressure pressure = $\frac{\text{force}}{\text{area}}$	
Trigonometric formulae			
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$			
Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$			
Area of triangle = $\frac{1}{2} ab \sin C$			

# Foundation Content

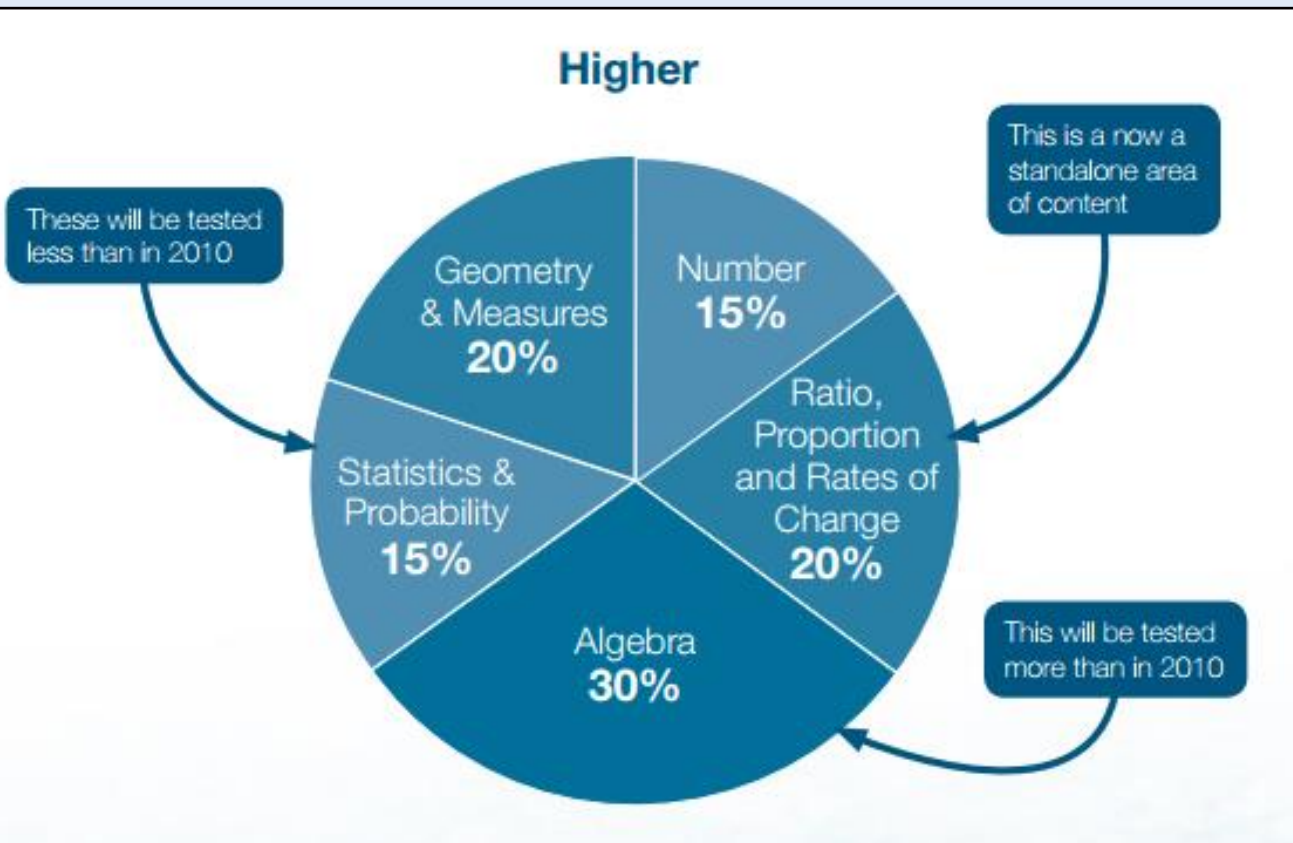
## Foundation



## 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  $n$ th term of quadratic sequences
- Calculate and interpret conditional probabilities through Venn diagrams

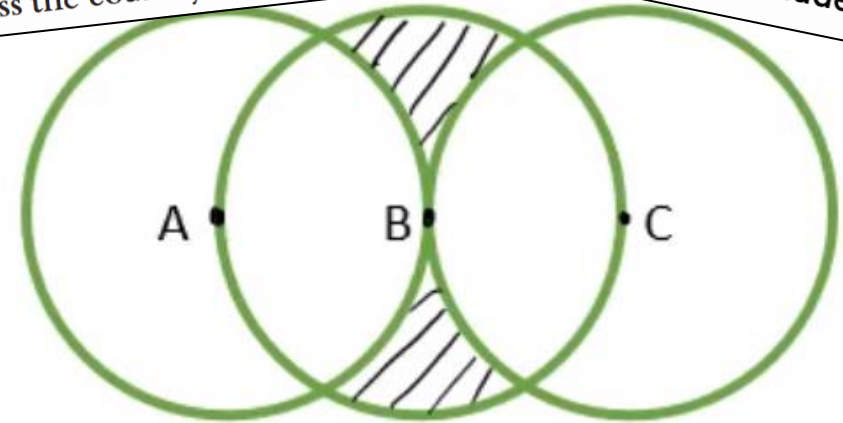
# Preparing for the challenge questions

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- 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**

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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

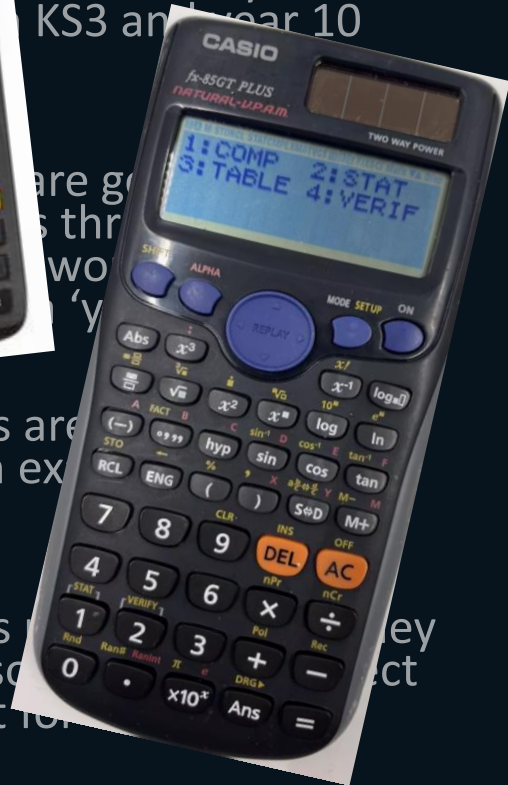
## Mathematics

of work for year 11  
KS3 and year 10

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- Students are copy down ex notes.

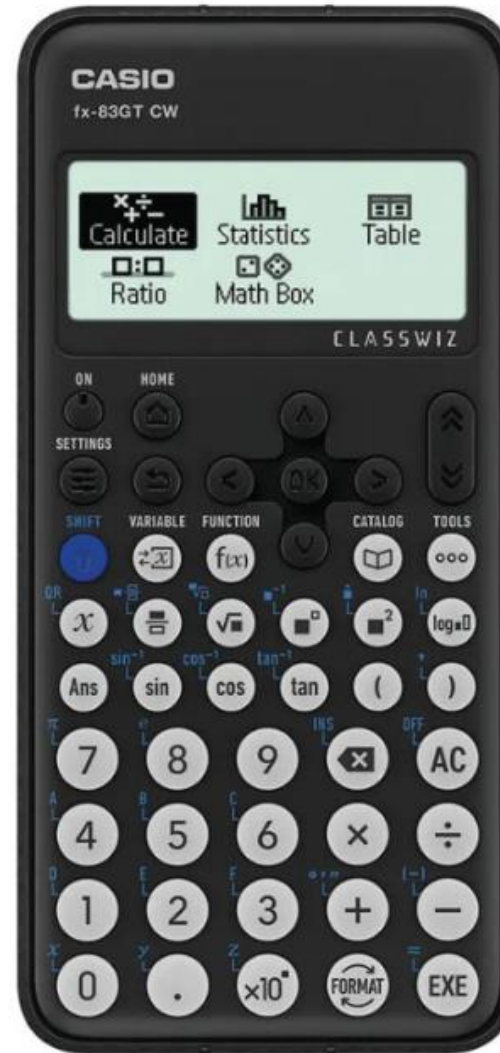
- Students attend less equipment for



### 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



2



## 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 =  $\frac{1}{2}ab \sin C$  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	4
13	Exponential graph	K613	4	3
	Draw and interpret a cumulative frequency graph	K557	5	2
	<b>TOTAL</b>		<b>49</b>	<b>28</b>

## QLA will be emailed home:

After term 1 exam (unit test)

After Mock 1 exam (Before Christmas)

After Mock 2 exam (Before Easter)

## Areas for development:

Topics in red should be revisited by students as part of a good revision strategy.

DrFrostMaths reference numbers are included.

## Tutors





### What to work on next?

Question Number	Topic	DrFront Math 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	2
5	Bounds	K454	2	3
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	1	0
10	Area of a triangle and Pythagoras	K511	1	0
11	Hidden Pythagoras	K509	4	2
12	Speed distance time		4	3
13	Exponential graph	K613	4	2
	Draw and interpret a cumulative frequency graph	K557	5	
	<b>TOTAL</b>		<b>49</b>	<b>28</b>

YOUR COURSES

**Year 11 (Foundation)**  
**Edexcel 2022 Foundation P1-3**

[+Add Course](#)

### Resources

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

### Notifications

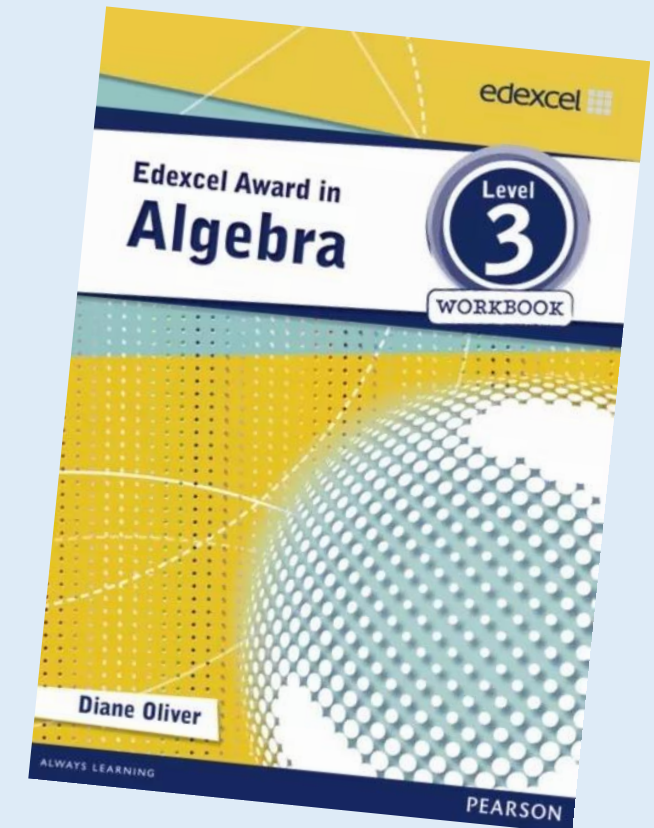
- You have been set a task by your teacher Mr K Knowles. Click to start it.  
5 MONTHS AGO  
Exam type questions - GCSE practice. (this is for all papers)
- You have been set a task by your teacher Mr K Knowles. Click to start it.  
5 MONTHS AGO  
Paper 2 - Topics in your GCSE - Complete
- You have been 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
- You have been set a task by your teacher Mr K Knowles. Click to start it.

Paper 3 - Topics in your GCSE - Complete  
Set by Mr K Knowles

[Review All](#)


# Algebra Level 3 & Number Level 1 exam

- Level 1 number and measure exam – Tuesday 7<sup>th</sup> January.
  - First day back after Christmas break
  - 30 minute non calculator paper
  - 1 hour calculator paper
  - 9am start
- Level 3 algebra exam – Friday 10<sup>th</sup> January.
  - Two hour paper
  - No calculator
  - 9am start




# Other sites & resources

< All teams










 **KSH - \*KS4 Resources** ...

▼ Main Channels  
General

 **General** Posts Files ▾ 01 Full Marks Compos... (+)

[+ New ▾](#) [↑ Upload ▾](#) [Edit in grid view](#) [Share](#) [Copy link](#) [Sync](#) [Add shortcut to OneDrive](#) [Download](#) [Open in SharePoint](#)

Documents > General > Maths > Year 11 > **General resources**

 Name ▾	Modified ▾	Modified By ▾	+ Add column
 Exam papers (Not available on most websites)	May 22	Kevin Knowles	
 Paper 1 Prep	May 22	Kevin Knowles	
 Skills papers - Foundation	May 22	Kevin Knowles	
 Skills papers - Higher	May 22	Kevin Knowles	
 Targeting Grade 4	May 22	Kevin Knowles	
 Targeting Grade 5	May 22	Kevin Knowles	
 Targeting Grade 7	May 22	Kevin Knowles	
 Targeting Grade 9	May 22	Kevin Knowles	

# Other sites & resources

Maths Genie

GCSE Revision

GCSE Papers ▾

A Level Revision

A Level Papers ▾

KS2 Revision

Resources

## Edexcel GCSE Exam Papers

Pearson Education accepts no responsibility whatsoever for the accuracy or method of working in the answers given.

[Grade Boundaries](#)

For GCSE Maths I am using the Casio Scientific Calculator: [Casio Scientific Calculator](#)

## Foundation GCSE Exam Papers

Paper	Answers
<a href="#">2020 Paper 1</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶
<a href="#">2020 Paper 2</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶
<a href="#">2020 Paper 3</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶
<a href="#">November 2019 Paper 1</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶
<a href="#">November 2019 Paper 2</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶
<a href="#">November 2019 Paper 3</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶
<a href="#">June 2019 Paper 1</a>	<a href="#">MS</a> <a href="#">Ans</a> ▶