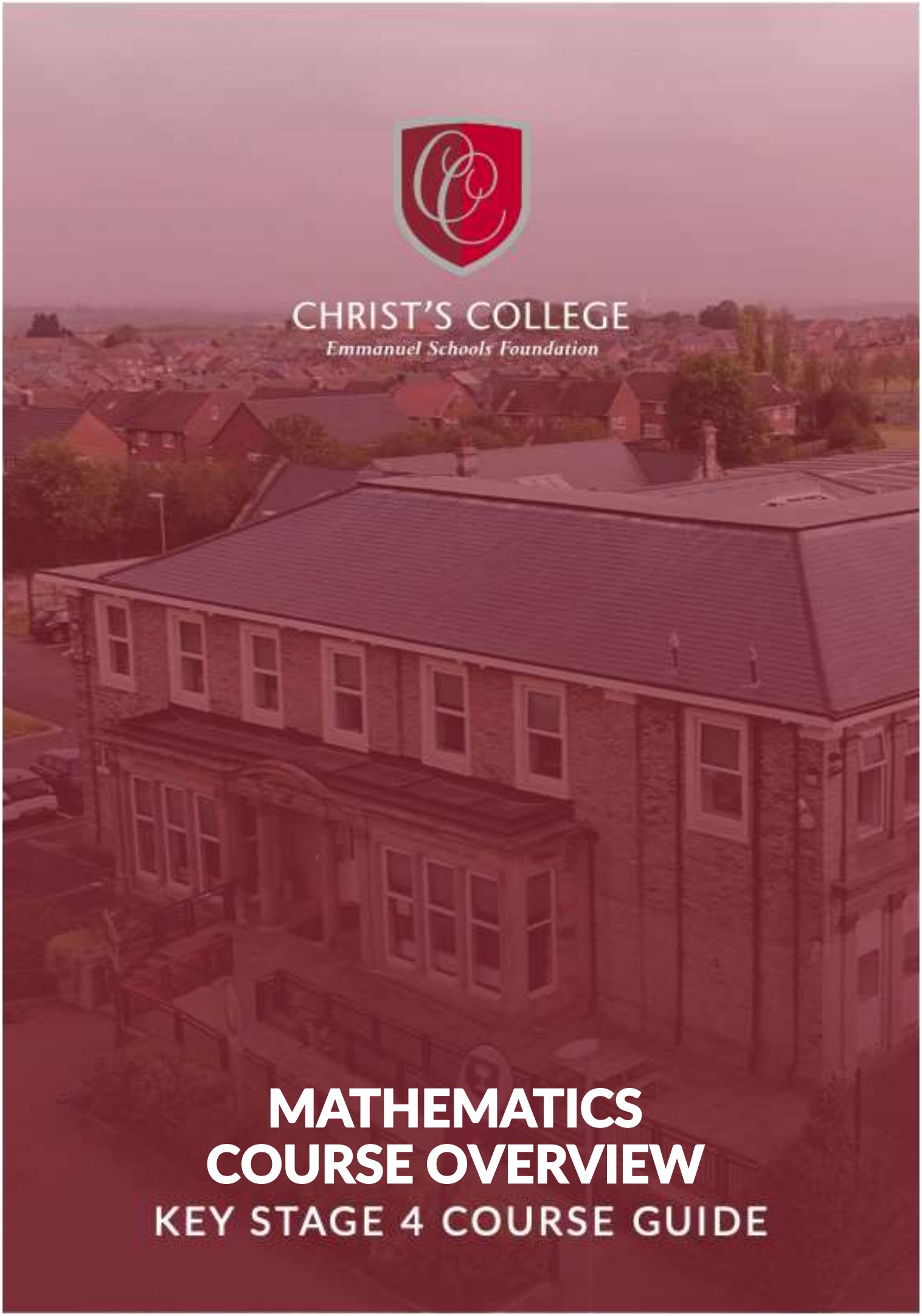


CHRIST'S COLLEGE

Emmanuel Schools Foundation

MATHEMATICS COURSE OVERVIEW

KEY STAGE 4 COURSE GUIDE

COURSE OVERVIEW

GCSE maths is split into two tiers. The school will decide your tier of entry, based on your classwork and mock exams.

The tiers assess different content, so it's worth knowing which tier you're likely working towards.

Tier	Topic area	Weighting
Foundation	Number	22 - 28%
	Algebra	17 - 23%
	Ratio, Proportion and Rates of change	22 - 28%
	Geometry and Measures	12 - 18%
	Statistics & Probability	12 - 18%
Higher	Number	12 - 18%
	Algebra	27 - 33%
	Ratio, Proportion and Rates of change	17 - 23%
	Geometry and Measures	17 - 23%
	Statistics & Probability	12 - 18%

Exam structure

- Three 90-minute exams
- One non-calculator paper
- Two calculator papers
- Content from each topic area can be assessed in any of the three papers

Higher Tier

- Can achieve a grade 3 to 9 (or a U)
- Higher focus on algebra and geometry

Foundation Tier

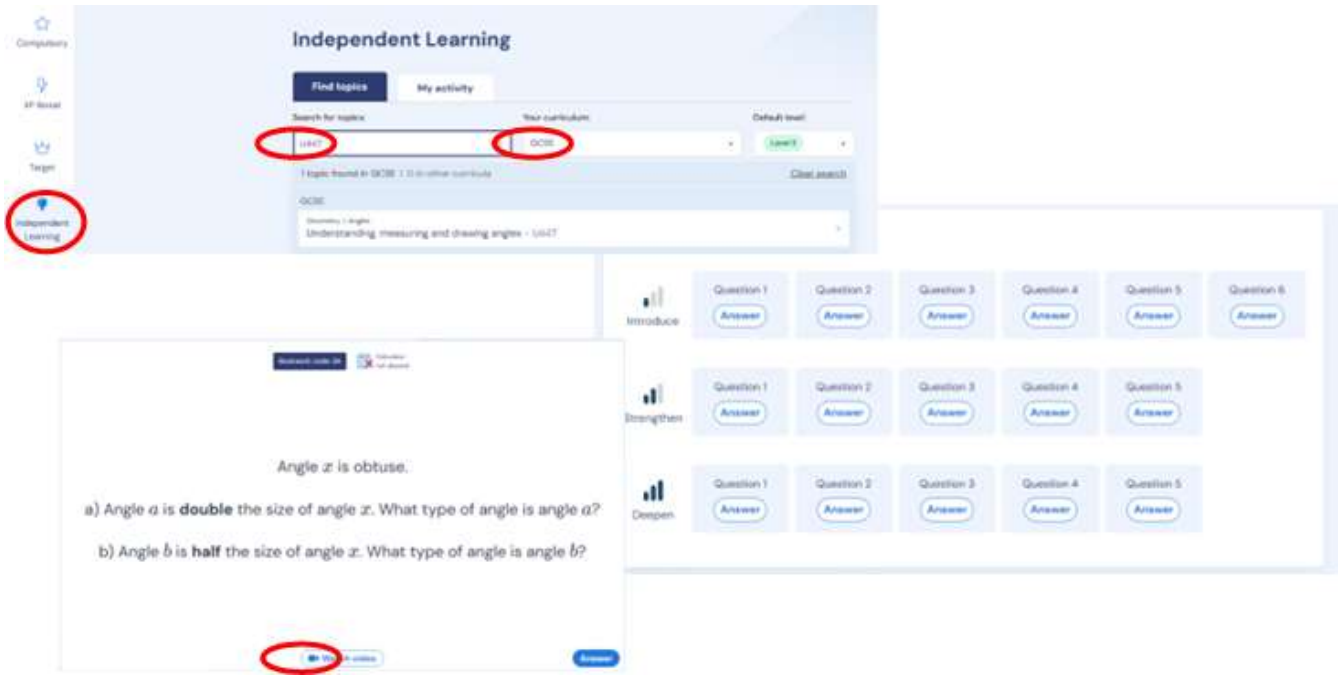
- Can achieve a grade 1 to 5 (or a U)
- Higher focus on number and ratio

REVISION STRATEGIES

Questions	Topic	Score	Sparx Code
1	Rounding integers	1 / 1	U480
2	Converting between fractions, decimals and percentages	1 / 1	U888
3	Understanding, measuring and drawing angles	0 / 1	U447
4	Understanding and ordering decimals	1 / 1	U435
5	Calculating with roots and powers	1 / 1	U851
6	Add & subtract decimals, Use a written method to multiply & divide with decimals	1 / 4	U478,U293,U868
7	Drawing bar charts	4 / 4	U363
8ai	Angles on a line and about a point	2 / 2	U390
8aii	Angles on a line and about a point	0 / 1	U390
9a	Function machines with numbers	1 / 1	M175
9b	Function machines with numbers	2 / 2	M175
9c	Function machines with letters, Constructing and solving equations	0 / 2	M428,U599
10	Writing and simplifying ratios	2 / 2	U687
11a	Multiplying and dividing with negative numbers	1 / 1	U548
11b	Calculating with roots and powers	1 / 1	U851
11c	Using the correct order of operations	0 / 1	U976
12	Finding the area and perimeter of simple shapes	4 / 4	U993
13a	Writing probabilities as fractions	1 / 1	U408
13b	Writing probabilities as fractions	0 / 2	U408
14	Using a written method to multiply integers	3 / 3	U177

There is a lot of content to cover in GCSE maths. It would be difficult to revise it all before your exams. It's much more effective to focus on the topics you need to improve on. Try to be strategic in your revision. Breaking revision into regular, manageable chunks is a good idea.

Use your question level analysis document from your mock exams to **identify topics to improve on**. The earlier the question is in the paper, the easier it should be to improve on. Prioritise questions you got wrong earlier on in each paper. If you've lost your sheets, ask your teacher for another copy at the end of a lesson. Once you've identified your revision topics, you need to **practice them**. Using Sparx provides you with targeted questions at varying levels of difficulty. The questions are automatically marked for you, and you can watch the support videos if you get stuck.

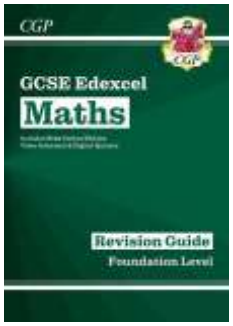


READING LIST
Revision Guides & Workbooks

CGP provide insightful revision guides and practice workbooks. The revision guides are a great tool for checking your understanding. The practice workbooks provide a good opportunity to do further practice of topics for the sake of revision, in addition to your work on Sparx. We sell revision guides through the school at a discounted rate.

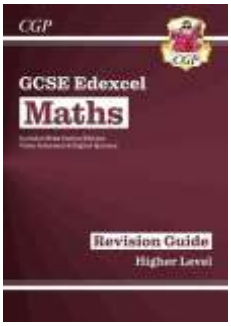
GCSE Maths Edexcel Revision Guide: Foundation

ISBN: 9781782944003



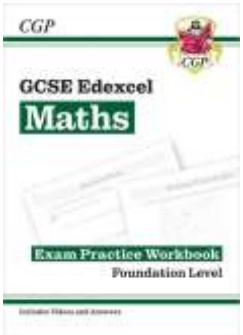
GCSE Maths Edexcel Revision Guide: Higher

ISBN: 9781782944041



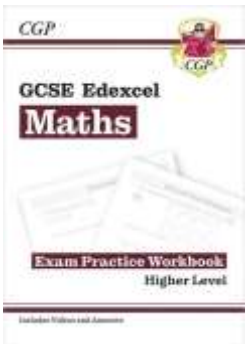
GCSE Maths Edexcel Exam Practice Workbook: Foundation

ISBN: 9781782943990



GCSE Maths Edexcel Exam Practice Workbook: Higher

ISBN: 9781782944034



READING LIST
Websites

Sparx is the best way for you to revise maths. Your teacher will direct you to appropriate topics for revision via your homework tasks and your question level analysis from your mocks. Sparx sets work at the appropriate level for you and supports you if you need it. If you want to do well in maths, you need to use Sparx.

Your username is your full name with no spaces e.g. joebloggs
You choose your password. If you forget it, click to request a password reset.

https://www.sparxmaths.uk/student

There are other websites that provide revision resources, but Sparx should be your primary source for online maths revision. Feel free to use other online resources to supplement the work you do on Sparx.

Maths Genie provided a good set of worksheets sorted by grade. They also provide a video and worked solutions to support.

https://www.mathsgenie.co.uk/gcse.php

CAREER PATHWAY

GCSE maths is a requirement for a number of next steps. Please look into courses you may be interested in to determine what grade you might need.

The majority of courses at college and sixth form require at least a grade 4 in English and maths. The same goes for apprenticeships and a number of jobs. If you do not achieve a grade 4 in school, you will be required to resit these exams in college. It is essential that you achieve at least a grade 4 in these subjects.

A number of subjects require a higher level of attainment in maths. These are subjects where the problem solving and reasoning skills learned in maths lessons are vital. If you are interested in science, engineering, finance, computing, technology, or similar, your course may well require a grade 6 or above at GCSE.

If you have an interest in the subject, you can consider studying maths at college or sixth form. A-Level maths is a challenging course suited to those with a keen interest in the subject. Level 3 core maths is more suited to students looking to improve their skills and use maths as a tool in other disciplines.

KS4 CURRICULUM PLAN

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Similarity						Developing Algebra					
	Congruence, similarity and enlargement			Trigonometry			Representing solutions of equations and inequalities			Simultaneous equations		
Spring	Geometry						Proportions and Proportional Change					
	Angles & bearings		Working with circles		Vectors		Ratios & fractions		Percentages and Interest		Probability	
Summer	Delving into data			Using number						Expressions		
	Collecting, representing and interpreting data			Non-calculator methods			Types of number and sequences		Indices and Roots		Manipulating expressions	

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Graphs						Algebra					
	Gradients & lines		Non-linear graphs		Using graphs		Expanding & factorising		Changing the subject		Functions	
Spring	Reasoning						Revision and Communication					
	Multiplicative		Geometric		Algebraic		Transforming& constructing			Listing & describing	Show that...	
Summer	Revision						Examinations					

The diagrams above show the units we'll cover in year 10 and year 11. For a more detailed breakdown, please see the knowledge organisers on our website, linked below.

https://christscollege.org.uk/curriculum/mathematics/

KNOWLEDGE CHECKLIST
Foundation

NUMBER

- Multiply Decimals
- Estimations
- Rounding
- Powers and Roots
- Use of a Calculator
- Combinations
- FDP Conversions
- Order of Operations
- Negative and Fractional Indices
- Highest Common Factor
- Lowest Common Multiple
- Product of Prime Factors
- Standard Form Conversions
- Standard Form Calculations
- Fraction Calculations
- Percentages of an Amount
- Percentage Changes
- Error Intervals

ALGEBRA

- Collecting Like Terms
- Substitution
- Using Formulae
- Laws of Indices
- Expanding and Simplifying
- Factorising Expressions
- Expanding Double Brackets
- Factorising Quadratics
- Rearranging Formulae
- Solving Equations
- Solving Quadratic Equations
- Forming and Solving Equations
- Linear Simultaneous Equations
- Solving Linear Inequalities
- Drawing Inequalities
- Linear Sequences
- Picture Sequences
- Special Sequences
- Coordinates
- Drawing Linear Graphs
- Interpreting the Gradient
- Writing the Equation of a Line
- Drawing Quadratic Graphs
- Roots and Turning Points
- Drawing Cubic Graphs
- Drawing Reciprocal Graphs

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TRIGONOMETRY

- Pythagoras Theorem
- SOHCAHTOA Sides Lengths
- SOHCAHTOA Angles
- Exact Trigonometry

REVISION VIDEOS

Everything you need to get a Grade 5 (Higher & Foundation)

STATISTICS

- Averages
- Reverse Mean
- Averages from a Table
- Grouped Frequency Tables
- Bar Charts
- Pictograms
- Dual/Composite Bar Charts
- Scatter Graphs
- Frequency Polygons
- Pie Charts
- Averages from a Stem and Leaf
- Sampling and Bias

SUBSCRIBE

The GCSE Maths Tutor YouTube Channel

RATIO & PROPORTION

- Simplifying a Ratio
- Sharing in a Ratio
- Three Part Ratios
- Writing Ratios as Fractions
- Recipes
- Exchange Rates
- Best Value Purchases
- Conversion Graphs
- Unit Conversions
- Reverse Percentages
- Simple/Compound Interest
- Depreciation
- Direct Proportion in context
- Inverse Proportion in context
- Distance-Time Graphs
- Speed, Distance & Time
- Mass, Density & Volume
- Pressure, Force & Area

GEOMETRY

- Triangles & Quadrilaterals
- Area of 2D Shapes
- Angles in Parallel Lines
- Angles in Polygons
- Plans & Elevations
- Constructions
- Perpendicular/Angle Bisectors
- Solving Loci Problems
- Area & Circumference of Circles
- Circle Sectors
- Surface Area of 3D Shapes
- Volume of 3D Shapes
- Cylinders, Cones & Spheres
- Transformations
- Bearings
- Similar Shapes
- Congruent Triangles
- Column Vectors

PROBABILITY

- Writing Probabilities
- Probability from a Table
- Venn Diagrams
- Set Theory
- Frequency Trees
- Two Way Tables
- Probability Trees (Fractions)
- Probability Trees (Decimals)

FORMULA VIDEOS

All the GCSE Maths Formulas Grade 5+ (Higher & Foundation)

KNOWLEDGE CHECKLIST
Higher

NUMBER

- [ ] Multiply Decimals
- [ ] Product Rule for Counting
- [ ] Estimations
- [ ] Laws of Indices
- [ ] Negative and Fractional Indices
- [ ] Highest Common Factor
- [ ] Lowest Common Multiple
- [ ] Product of Prime Factors
- [ ] Standard Form Conversions
- [ ] Standard Form Calculations
- [ ] Surds Calculations
- [ ] Rationalising Fractional Surds
- [ ] Fraction Calculations
- [ ] Recurring Decimals
- [ ] Percentages of an Amount
- [ ] Reverse Percentages
- [ ] Error Intervals
- [ ] Calculating with Bounds

ALGEBRA

- [ ] Collecting Like Terms
- [ ] Substitution
- [ ] Laws of Indices
- [ ] Expanding and Simplifying
- [ ] Factorising Expressions
- [ ] Expanding Double Brackets
- [ ] Factorising Quadratics
- [ ] Expanding Triple Brackets
- [ ] Rearranging Formulae
- [ ] Solving Equations
- [ ] Linear Sequences
- [ ] Quadratic Sequences
- [ ] Geometric Sequences
- [ ] Linear Graphs
- [ ] Quadratic/Cubic Graphs
- [ ] Reciprocal/Exponential Graphs
- [ ] Perpendicular Lines
- [ ] Equations & Tangents of Circles
- [ ] Forming and Solving Equations
- [ ] Solving Quadratic Equations
- [ ] The Quadratic Formula
- [ ] Completing the Square
- [ ] Solving Linear Inequalities
- [ ] Graphical Inequalities
- [ ] Solving Quadratic Inequalities
- [ ] Linear Simultaneous Equations
- [ ] Quadratic Sim. Equations
- [ ] Iterations
- [ ] Function Calculations
- [ ] Inverse / Composite Functions
- [ ] Simplifying Algebraic Fractions
- [ ] Algebraic Fraction Calculations
- [ ] Graph Transformations
- [ ] Algebraic Proof

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TRIGONOMETRY

- [ ] Pythagoras Theorem
- [ ] 3D Pythagoras
- [ ] SOHCAHTOA Sides Lengths
- [ ] SOHCAHTOA Angles
- [ ] Sine Rule
- [ ] Cosine Rule
- [ ] 3D Trigonometry
- [ ] Area of a Triangle
- [ ] Exact Trigonometry
- [ ] Trigonometric Graphs

REVISION VIDEOS

Everything you need to get a Grade 5 (Higher & Foundation)

Everything you need to get a Grade 6-9 (Higher Only)

STATISTICS

- [ ] Averages
- [ ] Reverse Mean
- [ ] Averages from a Table
- [ ] Grouped Frequency Tables
- [ ] Scatter Graphs
- [ ] Frequency Polygons
- [ ] Sampling and Bias
- [ ] Pie Charts
- [ ] Interquartile Range
- [ ] Box Plots
- [ ] Averages from a Stem and Leaf
- [ ] Cumulative Frequency Graphs
- [ ] Histograms

SUBSCRIBE

The GCSE Maths Tutor YouTube Channel

RATIO & PROPORTION

- [ ] Sharing in a Ratio
- [ ] Three Part Ratios
- [ ] Writing Ratios as Fractions
- [ ] Recipes
- [ ] Exchange Rates
- [ ] Best Value Purchases
- [ ] Conversion Graphs
- [ ] Compound Interest
- [ ] Depreciation
- [ ] Direct Proportion
- [ ] Inverse Proportion
- [ ] Speed, Distance & Time
- [ ] Mass, Density & Volume
- [ ] Pressure, Force & Area
- [ ] Velocity Time Graphs
- [ ] Area under a Graph
- [ ] Gradient of a Graph
- [ ] Equating Ratios

GEOMETRY

- [ ] Triangles & Quadrilaterals
- [ ] Area of 2D Shapes
- [ ] Angles in Parallel Lines
- [ ] Angles in Polygons
- [ ] Plans & Elevations
- [ ] Construction & Loci
- [ ] Area & Circumference of Circles
- [ ] Circle Sectors
- [ ] Surface Area of 3D Shapes
- [ ] Volume of 3D Shapes
- [ ] Cylinders, Cones & Spheres
- [ ] Transformations
- [ ] Bearings
- [ ] Similar Shapes
- [ ] Congruent Triangles
- [ ] Circle Theorems
- [ ] Vectors
- [ ] Geometric Proof

PROBABILITY

- [ ] Probability from a Table
- [ ] Relative Frequency
- [ ] Venn Diagrams
- [ ] Set Theory
- [ ] Frequency Trees
- [ ] Two Way Tables
- [ ] Probability Trees (Independent)
- [ ] Probability Trees (Dependent)
- [ ] Probability Equations

FORMULA VIDEOS

All the GCSE Maths Formulas Grade 5+ (Higher & Foundation)

All the GCSE Maths Formulas Grade 6-9 (Higher Only)

LITERACY REQUIREMENTS

Literacy skills are crucial for success across all subjects, even in maths.

Developing strong reading comprehension, vocabulary and writing skills will help students to understand exam questions, analyse information, and articulate their knowledge effectively. Daily reading, across a wide range of texts, will assist students to build these skills.

In Year 10, students are required to read Accelerated Reader books daily and pass quizzes (books can be borrowed from the College library). In Year 11, the reading focus is on revision material.

The following literacy requirements are specific to maths:

- Students should know the key vocabulary terms and their definitions. Key vocabulary is included on the knowledge organisers, which are in student books and on the Christ's College website. Command words are listed on the next page of this booklet.
- Students need to be able to write clearly. Written responses to questions are required to achieve full marks in maths.
- The reading age required to fully comprehend all questions on GCSE papers is 15.6 years. Maths is no exception. Students need to be able to read and understand problems before they can begin to solve them.

COMMAND WORDS

Command words		What you need to know
1	**Calculate**	A calculator and some working will be needed.
2	**Change**	Usually convert from one unit to another; either using known metric unit conversions or the use of a conversion graph.
3	**Complete**	Fill in missing values. For example, on a probability tree diagram or a table of values.
4	**Describe**	Write a sentence that gives the features of the situation. For example, describing a transformation or trend in a graph.
5	**Draw**	Produce an accurate drawing (unless a sketch is being drawn). For example, draw a graph, draw an accurate elevation of a pyramid.
6	**Draw a sketch of...** **Sketch**	Produce a drawing that does not have to be drawn to scale **or** a graph that is drawn without working out each coordinate. For example, sketch a graph, sketch a cylinder.
7	**Expand**	Remove brackets.
8	**Expand and simplify**	Remove brackets and the collect like terms.
9	**Explain**	Write a sentence or a mathematical statement to show how you got to your answer or reached your conclusion.
10	**Express**	Re-write in another form, some working may be needed.
11	**Factorise**	Insert brackets by taking out common factors.

COMMAND WORDS

Command words		What you need to know
12	**Factorise fully**	Insert brackets by taking out **all** the common factors.
13	**Find**	Some working will be needed to get to the final answer.
14	**Give a reason**	Must be clear and accurate reasons. If the reasons are geometrical then make sure you: - provide a reason for each stage of working (if required), - use correct geometric terminology.
15	**Justify**	Show all working and/or give a written explanation.
16	**Prove**	More formal than 'show', all steps must be present. In the case of a geometrical proof, reasons must be given.
17	**Prove algebraically**	Use algebra in the proof.
18	**Show**	All working needed to get to a given answer **or** complete a diagram to show given information.
19	**Simplify**	Simplify the given expression
20	**Simplify fully**	Simplify the given expression. Answer must be given in its simplest form.
21	**Solve**	Find the solution of an equation or inequality.
22	**Solve algebraically**	Find the solution of an equation or inequality; algebraic manipulation **must** be shown.
23	**Write down**	No working is needed.
24	**Write**	No working needed for 1 mark questions. Working may be needed questions with more than 1 mark.
25	**Work out**	Some working will be needed in order to get the answer.

CHRIST'S COLLEGE

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