# Collins A-level Mathematics FAQs

A-level Maths: what’s changing and what’s staying the same?

1. **Has much changed between the legacy specs and the incoming specs?**

*There are three main changes.* ***Firstly****, the new spec is a linear not modular course. All assessment – consisting solely of exams – will take place at the end of the course and students will be tested on the entire content of the course.*

*Our resources prepare your students for terminal assessment with a carefully designed learning journey that builds and extends on previously mastered content and makes clear links between different areas of mathematics.*

***Secondly****, the new specifications have 100% prescribed content covering Pure Mathematics, Statistics and Mechanics. Much of this content is drawn from C1-4, S1, S2 and S3, and M1 and M2 of the legacy specs, but some additional content has come in (including specific proofs, use of functions in modelling, small angle approximations and exact value for sin, cos and tan, cobweb and staircase diagrams, differentiation problems involving connected rates of change and inverse functions, and finding your own substitutions for integration; data cleaning and more interpretation in statistics, understanding of correlation coefficients and p-values, and the use of a large data set; more modelling throughout, especially in mechanics) and other content has been removed (eg, decision mathematics now sits in Further Mathematics).*

*Our resources fully cover all the specification content, and tailored fully to the new assessment approach.*

***Thirdly****, there is an increased emphasis on problem-solving, modelling, reasoning (including proof) and use of technology in the new A-level – in the overarching themes and in the Assessment Objectives*

*Our resources specifically support these new emphases with marginal features and question-type labelling to enable students to recognise, practice and develop these skills throughout their course.*

1. **Does the AS qualification grade count towards the A-level?**

*No, AS and A-levels have been de-coupled so that, while students can sit an AS level halfway through the two-year course, the grade awarded at AS will not be counted towards the full A-level grade. The AS qualification will count for UCAS points unless the full A-level has been awarded.*

1. **How are the AS and A-level Mathematics courses structured for each exam board?**

*AQA AS Mathematics consists of two written examinations:*

* *Paper 1: Pure Mathematics and Mechanics (1 hour 30 mins, 80 marks, 50% of the qualification)*
* *Paper 2: Pure Mathematics and Statistics (1 hour 30 mins, 80 marks, 50% of the qualification)*

*AQA A-level Mathematics consists of three written examinations:*

* *Paper 1: Pure Mathematics (2 hours, 100 marks, 33.33% of the qualification)*
* *Paper 2: Pure Mathematics and Mechanics (2 hours, 100 marks, 33.33% of the qualification)*
* *Paper 3: Pure Mathematics and Statistics (2 hours, 100 marks, 33.33% of the qualification)*

*Edexcel AS Mathematics consists of two written examinations:*

* *Paper 1: Pure Mathematics (2 hours, 100 marks, 62.5% of the qualification)*
* *Paper 2: Statistics and Mechanics (1 hour 15 mins, 60 marks, 37.5% of the qualification; clear separation between Statistics and Mechanics content)*

*Edexcel A-level Mathematics consists of three written examinations:*

* *Paper 1: Pure Mathematics (2 hours, 100 marks, 33.33% of the qualification)*
* *Paper 2: Pure Mathematics (2 hours, 100 marks, 33.33% of the qualification)*
* *Paper 3: Statistics and Mechanics (2 hours, 100 marks, 33.33% of the qualification; clear separation between Statistics and Mechanics content)*

*OCR AS Mathematics consists of two written exams:*

* *Paper 1: Pure Mathematics and Statistics (1 hour 30 mins, 75 marks, 50% of the qualification)*
* *Paper 2: Pure Mathematics and Mechanics (1 hour 30 mins, 75 marks, 50% of the qualification)*

*OCR A-level Mathematics consists of three written exams:*

* *Paper 1: Pure Mathematics (2 hours, 100 marks, 33.33% of the qualification)*
* *Paper 2: Pure Mathematics and Statistics (2 hours, 100 marks, 33.33% of the qualification)*
* *Paper 3: Pure Mathematics and Mechanics (2 hours, 100 marks, 33.33% of the qualification)*

*MEI (OCR) AS Mathematics consists of two written exams:*

* *Paper 1: Pure Mathematics and Mechanics (1 hour 30 mins, 75 marks, 50% of the qualification)*
* *Paper 2: Pure Mathematics and Statistics (1 hour 30 mins, 75 marks, 50% of the qualification)*

*MEI (OCR) A-level Mathematics consists of three written exams:*

* *Paper 1: Pure Mathematics and Mechanics (2 hours, 100 marks, 36.4% of the qualification)*
* *Paper 2: Pure Mathematics and Statistics (2 hours, 100 marks, 36.4% of the qualification)*
* *Paper 3: Pure Mathematics and Comprehension (2 hours, 75 marks, 27.2% of the qualification)*

1. **Can AS Mathematics be co-delivered with A-level Mathematics?**

*Yes, the AS Maths content is a subset of the full A-level, so can be delivered as Year 1 of a two-year A-level course. We cover the full course in two student books:*

* *the* ***Year 1 and AS Student Book*** *covers the Pure, Statistics and Mechanics content that will be tested at AS level. The graduated practice questions test this content at A-level demand at the higher end, so the book can be used as preparation for the full A-level.*
* *the* ***Year 2 Student Book*** *covers the additional Pure, Statistics and Mechanics content that* ***builds on*** *the Year 1/AS content and will be tested* ***in addition to*** *this at A-level. Students will be tested on the content of* ***both*** *books if they take the full A-level.*

1. **Can AS and A-level Further Mathematics be co-delivered with AS and A-level Mathematics?**

*There is a core of compulsory pure maths content for AS/A-level Further Mathematics that is common to all exam boards but not shared with AS/A-level Mathematics. Each board has then taken a different approach with the additional pure maths and applied content that makes up the qualification, and there are a variety of optional routes through both AS and A-level Further Mathematics. There is no longer any shared content between Mathematics and Further Mathematics.*

*There is no requirement to follow the same exam board for Maths and Further Maths, and the qualifications can be taught and resourced quite separately if desired.*

1. **What does “synoptic assessment” mean in the context of A-level Maths?**

*Synoptic assessment requires students to work across different parts of a qualification and to show their accumulated knowledge and understanding of a topic or subject area. In practice, this means that students will need to be able to combine skills and knowledge from different areas of the specification and apply them to exam questions.*

*Our resources prepare your students for synoptic assessment with teaching content that makes links between different topics and areas of maths clear, worked examples that build deep understanding, and end-of-chapter exam-style practice. Additional online exam-style practice (including mock papers) provides excellent opportunities to become confident with selecting and applying mathematical skills synoptically.*

1. **Is the new content more challenging?**

*The new AS and A-level Mathematics qualifications are not intended to be of increased difficulty: the overall size and level of demand is equivalent to the current specifications. However, the move from modular to linear assessment means that students will have to master and retain all of the course content for terminal assessment, which is likely to raise the overall level of challenge.*

*Collins textbooks are written especially for the new linear qualification: unlike competitors, these are not adapted from previous modular resources. The Student Books and accompanying Connect resources have been designed to support students in mastering the entire course content, giving them the depth of understanding and quantity of practice they need to succeed.*

How do Collins resources support the new specifications?

1. **Do Collins resources provide complete coverage of the new specifications?**

*Yes, the books were written from scratch for the new A-level course, so you can have confidence that all the material your students need is fully covered, and that our books provide realistic assessment preparation.*

*Our Student Books broadly follow the order and organisation of the DfE-specified Subject Content for AS and A-level Mathematics. In a few cases, we have chosen to group topics together slightly differently to create a logical learning journey and build on prior knowledge. The main instances of this are:*

***Year 1 and AS Student Book:***

* *We introduce* ***binomial expansion*** *(D1) alongside content on manipulating polynominals algebraically (B6), and using indices and surds (B1 an B2). In this way, students start the course with a thorough grounding in the key algebraic skills they will need to tackle other areas of the course.*
* *As one of the key emphases for the new A-level, we cover* ***proof*** *throughout the textbook, with* ***proof boxes*** *explaining proofs in context. Once students have experienced proofs in context, we provide full coverage of* ***proof by deduction****,* ***proof by exhaustion*** *and* ***proof by counter example*** *(A1) in Chapter 11, drawing together knowledge and skills synoptically.*
* *We place* ***data presentation and interpretation*** *(L1-L4) as the first statistics chapter, so that students can build on the definitions and skills they’ve learnt at GCSE and develop the key skills they’ll need to work with the large data set.*
* *We have combined* ***probability*** *(M1) and* ***probability distributions*** *(N1) into one chapter, as these fit naturally together for teaching.*
* *We have combined* ***statistical sampling*** *(K1) and* ***hypothesis testing*** *(O1 and O2) into one chapter, as these fit naturally together for teaching.*
* *We cover* ***quantities and units in mechanics*** *(P1) in context in Chapter 15 Kinematics and Chapter 16 Forces, rather than in abstract as a definitions chapter.*

***Year 2 Student Book:***

* *We have separated the* ***partial fractions*** *content (B10) out from the rest of the A-level only algebra and functions content. This is a topic that can be taught discretely, and its connection to integration, differentiation and series expansion can be brought out in its own chapter.*
* *We have chosen to split the A-level only content on* ***differentiation*** *(G2, G4-G6) into two chapters to improve the teaching and learning sequence.*
* *As with the Year 1 and AS Student Book, we cover proof throughout with the* ***proof boxes*** *feature. Once students have experienced proofs in context, we provide full coverage of the A-level extension content on* ***proof by deduction*** *and* ***proof by contradiction*** *(A1) in Chapter 11.*

*Our comprehensive Schemes of Work (downloadable for free from* [www.collins.co.uk/page/A-level+Mathematics](http://www.collins.co.uk/page/A-level+Mathematics)*) make it simple to see exactly what content is covered where, and enable you to plan your course as you wish.*

1. **What is the large data set and how will this element be assessed?**

*A new requirement for AS and A-level Mathematics is that students work with a large data set to perform statistical calculations. These data sets should contain real-life data and will prepare students for working with large data in further study and work contexts. Each exam board will publish its own large data set (AQA’s is on family food, Edexcel’s is on meteorological data, OCR’s is on census data, and MEI’s will rotate each year), and some exam questions on the Statistics paper will involve working with a subset of data extracted from this (the full data set will* ***not*** *be available in the exam). Questions will be written in such a way that students familiar with the content and contexts of the large data set will be at an advantage. The intention is that students use technology such as spreadsheets to interrogate the data set throughout their statistics course, fitting with the increased emphasis on interpretation of data and use of technology. In the final exam, they will only have scientific calculators to work with the extracts of data.*

*Collins Student Books include* ***Using the large data set*** *activity boxes, which are designed to be applied to any of the exam boards’ data sets. Through a series of carefully designed investigatory activities, which can be carried out in class or set as independent study, students will become familiar with the data and contexts and practice their statistical analysis and interpretation skills using authentic data.*

1. **How do Collins’ resources support problem-solving?**

*Problem-solving is at the heart of Collins’ A-level Mathematics resources. Building on our successful GCSE Maths approach, our A-level textbooks develop a problem-solving mindset with teaching that encourages probing question and efficient choice of methods. Our worked examples model good practice in problem-solving, with in-context commentary to elucidate thinking and alternative methods to encourage analysis. Carefully designed and ramped up exercises and practice questions that require a problem-solving approach are specifically labelled so that students are aware of the skills and approaches they are using. Exam-style questions mimic the new problem-solving questions from sample assessments, giving students opportunities to practice their skills in authentic contexts.*

*Throughout our books,* ***stop and think*** *activities pose probing questions that can be used for class discussions or independently to deepen understanding and develop lateral thinking.*

1. **How do Collins’ resources support reasoning and proof?**

*Our textbooks fully support students to tackle AO2 questions relating to reasoning, communicating mathematically, and using proof. The teaching content makes explanation explicit, modelling good mathematical communication. Worked examples with commentary bring out the reasoning behind mathematical processes and showcase how to communicate effectively. The marginal* ***proof box*** *feature builds students awareness of how proof is integral to mathematics, preparing them well for further study.*

*Exercises and practice questions designed to test these skills are labelled as ‘Communicating Mathematically’ and ‘Proof’, so students get plenty of practice and build their awareness of what is needed. Full worked solutions for all exercises and exam-style questions are made available to teachers, to guide students to set out their workings in the correct mathematical way, another key element of reasoning and communication mathematically.*

1. **How do Collins’ resources support modelling?**

*Modelling in all areas of mathematics, but especially mechanics, is a key skill students will need to develop to succeed in the new A-level. Modelling in mathematics takes real-life situations and makes assumptions to simplify and decide which features are important or not, to provide information about expected outcomes. The key skills that students need to develop to tackle modelling questions are deciding on an efficient mathematical approach, choosing appropriate assumptions to simplify the model, and critiquing the final model: does it provide a good approximation or does it need refining?*

*Our resources develop a modelling mindset throughout by making explicit the thinking behind modelling. Worked examples with annotations lead students through a deep understanding of the underlying mathematical thinking. Exercises and exam-style questions designed to test modelling skills are specifically labelled so that students are aware of the skills and approaches they are using.*

1. **How do Collins’ resources encourage the use of technology?**

*There is a requirement in the new AS and A-level that the use of technology should permeate the teaching and learning of mathematics. All students will need to have a calculator that can perform iteration, summary statistics and probabilities for standard statistical distributions; some types of graphic calculators are permissible in exams. Our resources support teachers and students to make the best use of available technology with a* ***technology box*** *marginal feature that suggests how different technologies can be used to further explore the maths.*

1. **How do you support assessment throughout the course?**

*Prior Knowledge questions at the start of each chapter in our Student Books can be used as a quick check-in assessment of students’ readiness to start the topic. The end-of-chapter exam-style questions in our Student Books give a snapshot of student’s mastery of the content. There are extension exam-style questions at the end of the book designed to stretch students further, and target the top grades at AS and A-level.*

1. **What additional support do you offer?**

*We have produced free and flexible Scheme of Works for AS and A-level, making it easy for you to plan your delivery. These can be downloaded from* [www.collins.co.uk/page/A-level+Mathematics](http://www.collins.co.uk/page/A-level+Mathematics)

*Students have access to a free ebook version of the textbook bundled with the print textbook. This is available to them for three years, making it easy for them to learn on the go, and contains lots of great features such as the ability to annotate, to make dynamic links between the two ebooks and sync notes to a range of devices.*

*Our* ***Bridging GCSE and A-level Maths*** *student book (9780008205010) is a short course designed to strengthen and build on GCSE skills, and can be used as preparation before or at the start of the A-level course to get students off on the right foot. It can be used with any GCSE and any A-level exam board.*