**Year 12 into year 13 summer work 2024**

During the second week back after the summer break, you will be given a full set of A-Level practice exams. Two will be papers covering pure topics and the third, applied topics. Below is a list of topics that will appear for this exam. You should use this list, practice books, textbook and solution bank, homework assignments, Beta and Alpha tests, YouTube and the set of practice papers located on Sharepoint to help with your revision. There are also past papers on various maths websites.

Remember, in maths, revision is more effective when questions are attempted.

**Topic list – pure paper 1**

**2 hour paper, 100 marks, calculator allowed. Formula booklet provided.**

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| **Topic** | **Textbook chapter reference** |
| Small angle approximations | B2: 5.5 |
| Using differentiation to find the equation of a tangent | B1: 12.9 |
| Radians with sectors, trig rules | B2: 5.2, 5.3 |
| Quotient rule and differentiating trig | B2: 9.5, 9.6 |
| Circles, tangents and discriminant | B1: 6.4 |
| Basic integration | B1: 13.2 |
| Factor theorem and algebraic division | B1: 7.1-7.3 |
| Geometric series | B2: 12.2, 12.3 |
| 3D Vectors | B2: 12.2, 12.3 |
| Composite functions, range and inverse functions. | B2: 2.2, 2.3, 2.4 |
| Iteration and diagrams | B2: 10.2 |
| Modelling with logs | B1: 14.8 |
| Trapezium rule | B2: 11.9 |
| Differentiation rules | B2: 9.3-9.6 |
| Differentiation from first principles | B1: 12.1 |
| Laws of logs | B1: 14.5 |
| Algebraic proof | B1: 7.4, 7.5 B2: 1.1 |
| Quadratic modelling | B1: 2.6 |

**Topic list – pure paper 2**

**2 hour paper, 100 marks, calculator allowed. Formula booklet provided.**

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| **Topic** | **Textbook chapter reference** |
| Second derivatives, concave vs convex | B2: 9.9 |
| Recurrence relations and sigma | B2: 3.6 |
| Parametric equations | B2: 8.1-8.2 |
| Logarithmic equations | B1: 14.6, 14.7 |
| Exponential modelling and differentiation | B1: 14.3, B2: 9.2 |
| Integration of polynomials | B1: 13.4 |
| Arithmetic sequences | B2: 3.1, 3.2 |
| 2D vectors | B1: 11.3-11.5 |
| Rcos(x+a) | B2: 7.5 |
| Implicit differentiation | B2: 9.8 |
| Algebraic proof | B1: 7.4, 7.5 |
| Solving trig equations | B1: 10.4-6, B2: 7.4 |
| Proving trig identities | B1: 10.6, B2: 7.6 |
| Rates of change | B2: 9.10 |
| Solving differential equations | B2: 11.10 |
| Binomial expansion | B2: 4.2 |
| Partial fractions | B2: 1.3-1.5 |
| Integration techniques | B2: 11.1-11.6 |
| Modulus equations and graphs | B2: 2.1, 2.5, 2.7 |
| Increasing and decreasing functions | B1: 12.7 |
| Integration to find area | B1: 13.5-7, B2: 11.8 |

**Topic list – applied paper**

**2 hour paper, 100 marks, calculator allowed. Formula booklet provided.**

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| **Topic** | **Textbook chapter reference** |
| Correlation, hypothesis testing, modelling | B2: 1.1-1.3 |
| Probability and Venn diagrams | B2: 2.2-2.4 |
| Binomial distribution hypothesis testing | B1: 6.2-6.3 |
| Large data set, mean and standard deviation | B1: 1.2, 1.3, 2.3, 2.4 |
| Normal distribution – probabilities and inverse problem | B2: 3.3-3.5 |
| Normal approximation to the binomial | B2: 3.6 |
| Variable acceleration with vectors | B2: 8.3-8.5 |
| F= ma, friction | B2: 5.3 |
| SUVAT with vectors | B2: 8.1 |
| Static rigid bodies | B2: 7.4 |
| Projectiles | B2: 6.2-6.4 |

These exams could affect your UCAS predicted grade. Students who do not achieve their predicted grade could be given some additional support to ensure that they are brought up to this level.

Please note, due to the nature of the mathematics A-Level, the course will become more demanding as the year progresses, so it is vital that you make these topics secure; you will build upon these in year 13.

YOU WILL NEED TO SHOW EVIDENCE OF REVISION TO YOUR TEACHERS ON YOUR RETURN TO SCHOOL IN SEPTEMBER