**Year 12 into year 13 summer work 2023**

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, homework assignments, Beta and Alpha tests, YouTube and the set of practice papers located on Moodle to help with your revision – THESE PAPERS ARE COMULSORY! 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 |
| Differentiation and classifying stationary points | B1: 12.9 |
| Arc length of a sector | B2: 5.2, 5.3 |
| Iterative methods | B2: 10.2 |
| Quotient rule and differentiating trig | B2: 9.5, 9.6 |
| Circles and equation of a tangent | B1: 6.4 |
| Definite integration | B1: 13.4 |
| Trig modelling | B2: 7.7 |
| Implicit differentiation | B2: 9.8 |
| Solving differential equations | B2: 11.10 |
| Binomial expansion, range of validity, approximation of values | B2: 4.2 |
| Exponential modelling | B1: 14.3 |
| Integration by parts | B2: 11.6 |
| Parametric equations | B2: 8.1-8.2 |

**Topic list – pure paper 2**

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

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| **Topic** | **Textbook chapter reference** |
| Composite functions, range and inverse functions. Sketching modulus functions | B2: 2.2, 2.3, 2.4 |
| 3D Vectors | B2: 12.2, 12.3 |
| Proof by counter example | B1: 7.4, 7.5 |
| Sums using sigma notation | B2: 3.6 |
| Newton-Raphson method | B2: 10.3 |
| Factor theorem and algebraic division | B1: 7.1-7.3 |
| Solving trig equations | B1: 10.4-6, B2: 7.4 |
| Quadratic modelling | B1: 2.6 |
| Differentiation from first principles | B1: 12.1 |
| Rates of change | B2: 9.10 |
| Partial fractions | B2: 1.3-1.5 |
| Increasing and decreasing functions | B1: 12.7  |
| Proving trig identities | B1: 10.6, B2: 7.6 |
| Integration to find area | B1: 13.5-7, B2: 11.8 |
| Exponential modelling and differentiation | B1: 14.3, B2: 9.2 |

**Topic list – applied paper**

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

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| **Topic** | **Textbook chapter reference** |
| PMCC, interesting correlation, hypothesis testing, variables | B2: 1.3, 4.1-4.2 |
| Binomial distribution hypothesis testing | B1: 6.2-6.3 |
| DRVs – setting up a model | B1: 6.1 |
| Sampling methods, box plots and mean and standard deviation | B1: 1.2, 1.3, 2.3, 2.4 |
| Normal distribution, probabilities, conditional probabilities, hypothesis testing on the mean | B2: Attachment and 3.7 |
| 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