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

During the second week back after the summer break, you will be given two exams that will test you on the work covered in year 12. One will be a paper covering pure topics and the other 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**

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

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| **Topic** | **Textbook chapter reference** |
| Indefinite integration of xn | 13.1 – 13.2 |
| Quadratic inequalities, discriminant and completing the square  | 3.5, 2.5, 2,2, 2.4 |
| Position vectors and magnitude | 11.3 – 11.4 |
| Equation of a straight line between two points and parallel lines | 5.2 – 5.3 |
| Laws of logs and logarithmic equations | 14.6 |
| Modelling with quadratics | 2.6 |
| Trigonometry: area of a triangle, ambiguous case in sine rule, cosine rule. | 9.3, 9.1,  |
| Modelling with differentiation  | 12.11 |
| Factor theorem, long division, sketching cubics and graph transformations | 7.3, 7.2, 4.1, 4.7 |
| Proof by first principles | 12.2 |
| Binomial expansion | 8.3-8.4 |
| Solving trigonometric equations with the use of identities | 10.6 |
| Logarithms and non-linear data | 14.8 |
| Equation of a circle, intersections and discriminant | 6.2, 6.3 |
| Equation of a normal using differentiation, graph intercepts and integration to find area under a curve. | 12.6, 13.5 |

**Topic list – applied paper**

**1 hour 30 mins paper, 80 marks, calculator allowed. Formula booklet provided.**

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| **Topic** | **Textbook chapter reference** |
| Conditional probability and tree diagrams | Bk2 2.5 |
| Ungrouped data, box plots, outliers, standard deviation, inter-percentile range, inverse normal to work out a range, commenting on suitability of normal distribution in a model. | Bk1 2.1-2.4, 3.1, 3.2Bk2 3.1, 3.3 |
| Discrete random variables – finding *k* and probabilities | Bk1 6.1 |
| Hypothesis testing on PMCC, exponential models in regression. | Bk2 1.1-1.3 |
| Modelling with the binomial distribution. Finding probabilities, expectation (mean). Commenting on suitability of binomial distribution in a model. | Bk1 6.2, 6.3 |
| Reverse Normal – finding *x*, mean or standard deviation, finding probabilities. Binomial problems made from Normal problems | Bk2 3.1-3.5 |
| Vertical motion under gravity | 9.5 |
| Velocity-time graphs | 9.2 |
| Variable acceleration, functions of time, differentiation, distance | 11.1, 11.2 |
| Pulleys | 10.6 |

These exams could affect your UCAS predicted grade in either a positive or a negative manner. 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