



**KS5 Skills**

**AO1 Use and apply standard techniques**

- select and correctly carry out routine procedures; and
- accurately recall facts, terminology and definitions

**AO2 Reason, interpret and communicate mathematically**

- construct rigorous mathematical arguments (including proofs)
- make deductions and inferences
- assess the validity of mathematical arguments
- explain their reasoning
- use mathematical language and notation correctly.

**AO3 Solve problems within mathematics and in other contexts**

- translate problems in mathematical and non-mathematical contexts into mathematical processes
- interpret solutions to problems in their original context, and, where appropriate, evaluate their accuracy and limitations
- translate situations in context into mathematical models
- use mathematical models
- evaluate the outcomes of modelling in context, recognise the limitations of models and, where appropriate, explain how to refine them.

**Addition skills to above**

- Represent equations both algebraically and graphically by considering key features of a function including intercepts, gradients, stationary points and limits
- Be fluent with manipulating algebraic equations, expressions and exact values in terms of  $\pi$  and logarithms
- Being able to identify a problem, if necessary breaking it down into smaller steps, and presenting the solution clearly with an understanding of how your assumptions effect your answer.
- Construct and present elegant logical arguments, using maths vocabulary to communicate solutions on paper and verbally
- Turning real-world problems into mathematical models
- Analyse data, find patterns and extract conclusions
- Become an adept user of technology, focusing on calculator use, Excel and graphing tools like Desmos

**Year 12 Knowledge**

**Pure**

Algebra and functions  
Coordinate geometry in the  $(x, y)$  plane  
Further algebra  
Trigonometry  
Vectors  
Differentiation  
Integration  
Exponentials and logarithms

**Statistics**

Statistical sampling  
Data presentation and interpretation  
Probability  
Statistical distributions  
Regression and correlation  
Probability  
The Normal distribution

**Year 13 Knowledge**

**Pure**

Proof/Algebraic and partial fractions  
Functions and modeling  
Series and sequences  
Binomial expansion  
Trigonometry  
Parametric equations  
Differentiation  
Numerical methods  
Integration  
Vectors

**Mechanics**

Modelling in mechanics  
Constant acceleration  
Forces and motion  
Variable acceleration  
Moments  
Forces at any angle  
Applications of kinematics  
Applications of forces

