



Year Group: **Year 13**

This is the plan for the taught curriculum during achievement period: **One (Sept-Dec)**

Brief summary of the topic/work being covered during this period

The Autumn term of Year 13 consists of only Pure content, and covers a large portion of the Year 2 Pure maths content of the A Level specification, taught between two members of staff:

Substantive knowledge

- Radians
- Trigonometric identities
- Parametric Equations, Modelling with parametric equations
- Know how to differentiate trigonometric functions, exponentials and logarithms using chain rule, quotient rule and product rule
- Implicit functions
- Use the second derivative to describe the behaviour of a functions
- Solve problems involving connected rates of Change
- Arithmetic sequences and series, Geometric sequences and series, Geometric sum to infinity, Sigma notation, Recurrence relations and Modelling with Series
- Construct simple differential equations
- Representing vectors, Magnitude and direction, Position vectors, Solving geometric problems and Modelling with Vectors

Disciplinary knowledge

- Exact values of angles, arc length and area of sectors and segments
- Define secant, cosecant and cotangent and of arcsin, arcos and arctan, and their relationships to sine, cosine and tangent;
- Convert between Cartesian and parametric forms, Sketch curves given in parametric form and find points of intersection
- Differentiate e^{kx} , $\sin kx$, $\cos kx$, $\tan kx$ and related sums, differences and constant multiples.
- Differentiate $\sin x$ and $\cos x$ from first principles
- Differentiate using the product rule, the quotient rule and the chain rule.
- Find equations of tangents and normal to curves given parametrically or implicitly.
- Construct simple differential equations in pure mathematics and in context
- Work with sequences including those given by a formula for the n th term and those generated by a simple relation;
- Derive and work with arithmetic and geometric sequences and series, including the formulae for n th term and the sum to n terms
- Apply knowledge of vectors to 3 dimensions.

There is also lots of time built in to this term for assessment and revision.

Prior knowledge needed for this unit/topic from previous teaching

1. Students will have met trigonometry using degrees during year 1 of the course, and will build on this to include problems involving ratios and complex trigonometric identities.
2. Students will be familiar with Cartesian equations of straight lines, circles and other polynomials, and have good algebraic manipulation skills to succeed in this topic.
3. Students will need a good foundation in year 1 calculus and high-level algebraic manipulation in order to develop this knowledge into the more complex functions being differentiated in year 2.
4. Students will be familiar with the binomial expansion from year 1 of the Key Stage 5 course, but also "nth term" of linear and quadratic sequences from GCSE.
5. Students will have a good understanding of 2D vectors and the associated terminology prior to working on vectors in 3 dimensions.

Rationale for students studying this unit/topic

The scheme of work is sequenced with all the Pure Maths content covered first during the first half of the year. This is to allow all students more revision and exam practice time on the complex algebraic manipulation and calculus questions, but also to allow students to meet key techniques in maths first, before building on these in Further Maths, for those studying both. It also allows students extended periods of revision for their year 1 applied content before building on this later on in the year at the end of the taught course.

Key concepts/ideas that are taught to students in this unit/topic, including any anticipated gaps in knowledge and plan to overcome these

None of the topics taught during this period are new to students – they are all building on and developing concepts taught last academic year, and all equally important to each other for success. As such, teachers will take some time at the beginning of each topic to assess memory of previous content and cover any gaps in knowledge, specific to their class. The AS Level assessment students will sit towards the middle of this term will also aid teachers in identifying any gaps before starting a topic, to ensure maximum progress is made on the second year content.

New key terminology students will be taught during this topic/unit

Tier 3

Parametric, Product/Quotient/Implicit in the context of further differentiation, Arithmetic and Geometric Progressions.

Plan for Assessment

- Students will be assessed regular throughout the achievement period through weekly homework tasks and formative class assessment.
- An AS Level paper will be used as an assessment prior to half term. This is because there is not enough year 2 content that has been covered yet, and we want to be able to assess them as accurately as possible. It is a good opportunity for students to recall previously taught knowledge, which will be built upon this year anyway.
- Formal whole school mocks generally take place in this period, and this is accounted for in the scheme of work. This will be a set of reduced A Level Papers, covering content taught to that point. In the event these do not happen, students will still sit this assessment during lesson time.