Foxford Learning Plan

YEAR 13 – A Level Maths

Algebraic methods, Functions and Graphs, Sequences and Series, Binomial Expansion, Radians, Trigonometric functions

Autumn 1

Key Vocabulary

Factor	A factor is a number that divides another number, leaving no remainder
Modulus function	A modulus function of a number gives the magnitude of a number irrespective of its sign.
Composite Function	A function made of other functions, where the output of one is the input to the other.
Sequence	A sequence is a list of elements (numbers) in which the order of elements matters
Series	A series is sum of infinite terms that follow a given rule; the cumulative sum of a given sequence of terms.
Polynomial	An expression which is composed of variables, constants and exponents, combined using mathematical operations
Binomial	A polynomial with just two terms joined by either a plus or minus sign
Radians	A unit of measure of angles made by taking the length of the radius and wrapping it round the circle
Arc length	The distance between two points on a circumference of a circle
Sector	A region of a circle bound by two radii and the intercepting arc of the circle
Trigonometry	Trigonometry studies the relationship between angles and side lengths in triangles
Segment	A region bound by a chord and a corresponding arc lying between the chord's endpoints

Key Skills

Over the course of the term, I will be able to: -

- Multiply and divide algebraic fractions
- Add and subtract two or more algebraic fractions
- Convert an expression with linear factors in the denominator into partial fractions
- Divide algebraic expressions
- Convert an improper fraction into partial fraction form

- Understand and use the modulus function
- Understand mappings and functions, and use domain and range
- Combine two or more functions to make a composite function
- Know how to find the inverse of a function graphically and algebraically

- Find the nth term of an arithmetic sequence
- Prove and use the formula for the sum of the first nth terms of an arithmetic series
- Find the nth term of a geometric sequence
- Prove and use the formula for the sum of a finite geometric series
- Generate sequences from recurrence relations

- Expand $(1+x)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid
- Expand $(a+bx)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid
- Use partial fractions to expand fractional expressions

- Convert between degrees and radians and apply this to trigonometric graphs and their transformations
- Know exact values of angles measured in radians
- Find an arc length using radians
- Find areas of sectors and segments using radians
- Solve trigonometric equations in radians
- Use approximation of trigonometric values when θ is small

- Understand the definitions of secant, cosecant and cotangent and their relationship to cos, sine and tangent
- Understand the graphs of secant, cosecant and cotangent and their domain and range
- Simplify expressions, prove simple identities and solve equations with secant, cosecant and cotangent
- Prove and use $\sec^2 x = 1 + \tan^2 x$ and $cosec^2 x = 1 + \cot^2 x$
- Understand and use inverse trigonometric functions and their domain and ranges