'MAGHULL HIGH SCHOOL – CURRICULUM MAP Year 13 Half Term 1

Unit:	Week 1 -2	Week 3-4	Week 5-6
LESSON TOPIC QUESTION(S)	**Objective:** Work with radian measure, including use for arc length and area of sector Know and use exact values of sin and cos for 0 , $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$, $\frac{\pi}{2}$, π and multiples thereof Know and use exact values of tan for 0 , $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$, π and multiples thereof Understand and use the definitions of secant, cosecant and cotangent and of arcsin, arccos and arctan Understand their relationships to sine, cosine and tangent Understanding of their graphs; their ranges and domains Inverse functions and their graphs	**Objective:** Simplify rational expressions including by factorising and cancelling, and algebraic division (by linear expressions only) The modulus of a linear function Understand and use composite functions Combinations of transformations (translations and stretches)	**Objective:** Understand and use the derivative of $sin\ x$ and $cos\ x$ The second derivative and its connection to convex and concave sections of curves and points of inflection Differentiate e^{kx}, a^{kx} , $sin\ kx$, $cos\ kx$, $tan\ kx$ and related sums, differences and constant multiples Understand and use the derivative of $ln\ x$ Apply differentiation to find points of inflection Differentiate using the product rule, the quotient rule and the chain rule, including problems involving connected rates of change and inverse functions
Knowledge & Skills development	Deepen fluency in working with radians for arc length and sector area • Build accuracy and recall of exact values for trigonometric functions at key angles • Master transformations and composites of functions, including inverse and modulus functions • Apply rules of differentiation to exponential, trigonometric, and logarithmic functions • Identify and analyse concavity, inflection points, and second derivatives in curve sketching • Refine algebraic manipulation of rational expressions and perform algebraic division		

Assessment / Feedback Opportunities	• Weekly diagnostic checks on key concepts such as exact values, differentiation, and function composition • Use of mini whiteboards and retrieval starters to identify misconceptions • Mid-unit formal assessment focusing on trigonometric functions and differentiation methods • Self and peer assessment of written mathematical justifications • Targeted feedback after extended answer practice and modelling of exemplar responses • Application of exam-style tasks for differentiated feedback and follow-up interventions
Key Vocabulary	Radians, Sector, Arc, Secant, Cosecant, Cotangent, Arcsin, Arccos, Arctan, Modulus, Composite function, Domain, Range, Graph transformation, Differentiation, Chain rule, Product rule, Quotient rule, Inflection point, Concavity
Literacy/Reading opportunities	• Structured writing tasks to explain transformations and derivatives • Sentence stems to support justification of domain/range decisions • Reading and evaluating modelled responses to extended problems • Glossary-building of complex mathematical terms through application • Deconstructing multi-step calculus and trigonometric word problems
Cross Curricular Themes	Physics – Applications of trigonometric and logarithmic functions in wave modelling and decay problems • Economics – Rate of change concepts in cost/revenue modelling • Computing – Algorithmic thinking and function design • Engineering – Application of differentiation in design and structural analysis • PE & Biology – Use of trigonometric and exponential models in biomechanics and growth analysis
Personal Development (Including British Values, RSE, Citizenship)	• Promote resilience when dealing with unfamiliar multi-step calculus and algebra tasks • Encourage critical thinking and independence in applying abstract methods to real-world problems • Reinforce precision and accuracy as valuable traits in analytical reasoning • Support confident communication of reasoning through structured discussions and peer explanation • Develop a growth mindset by embracing challenge and mathematical ambiguity
Career Opportunities	• Provides foundation for STEM careers in engineering, data science, physics, computing, and economics • Trigonometric modelling, calculus, and algebra relevant for architecture, actuarial science, and medicine • Encourages problem-solving and logical reasoning essential in law, finance, and technology sectors