Maths- Y13

HALF TERM 4 Feb-Apr	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
TOPIC (S):-Pure	Integration & Differential equations	Connected Rates of Change	Numerical Methods	Mock Revision	Mock Revision	Exam Technique	Revision and test all modules.
:-Statistics	Statistical hypothesis testing2	Statistical hypothesis testing2	Statistical hypothesis testing2	Mock Revision	Mock Revision	Exam Technique	
:-Mechanics	Moments	Moments	Moments	Mock Revision	Mock Revision	Exam Technique	

Knowledge & Skills development		
	Pure	**Integration & Differential equations:** Students should be able to use of functions in modelling, including consideration of limitations and refinements of the models, Differentiate simple functions and relations defined implicitly, for first derivative only. Evaluate the analytical solution of simple first order differential equations with separable variables, including finding particular solutions.(Separation of variables may require factorisation involving a common factor.) Students should be able to carry out any of the techniques of integration included in the previous sections. **Numerical Methods:** Locate roots of $f(x) = 0$ by considering changes of sign of $f(x)$ in an interval of x on which $f(x)$ is sufficiently well-behaved. Understand how change of sign methods can fail. Solve equations approximately using simple iterative methods; be able to draw associated cobweb and staircase diagrams. Solve equations using the Newton-Raphson method and other recurrence relations of the form $x_n + 1 = g(x_n)$. Understand how such methods can fail. Understand and use numerical integration of functions, including the use of the trapezium rule and estimating the approximate area under a curve and limits that it must lie between.
	Statistics	**Statistical hypothesis testing 2:** Understand and apply the language of statistical hypothesis testing, developed through a binomial model: null hypothesis; alternative hypothesis, significance level, test statistic, 1-tail test, 2-tail test, critical value, critical region, acceptance region, p-value; extend to correlation coefficients as measures of how close data points lie to a straight line and be able to interpret a given correlation coefficient using a given p-value or critical value (calculation of correlation coefficients is excluded). Conduct a statistical hypothesis test for the mean of a Normal distribution with known, given or assumed variance and interpret the results in context.
	Mechanics	**Moments:** Students should be able to understand and use moments in simple static contexts, know that the centre of mass of uniform beams and rectangular laminae can be determined by symmetry and to be able to answer questions in which forces act in perpendicular directions.

Assessment / Feedback Opportunities		Topic assessments	Self-assessment sheets	Homework	Formative teacher assessment - verbal	Retrieval practice	
Cultural Capital		• Tolerance and respect for peers and mathematicians • Democracy: allowing all to speak and voice views				
SMSC / Promoting British Values (Democracy, Liberty, Rule of Law, Tolerance & Respect)		Willingness to participate in, and respond to mathematical opportunities. Use of social skills in different contexts, including working and socialising with pupils from different religious, ethnic and socio-economic backgrounds.				
Reading opportunities		• Fermat's Last Theorem • History of computer programming • History of Isaac Newton(Newton's Laws of Motion) • The Man who knew Infinity by Robert Kanigel • What is Mathematics? by Richard Courant and Herbert Robbins				
Key Vocabulary		Differential, Analytical, Iterative, Newton-Raphson, Approximate, Hypothesis, Significance, Variance, Resultant, Moments, Perpendicular.				
Digital Literacy		Autograph, Desmos for graphing. Geogebra.				
Careers		Architect, Sports Science, Engineer, Statistician, Data Analyst, Business- manager, Market research. Computer Programmer, Video game development.				