Bishop Stopford's School

Curriculum Map Year 13

	Autumn 1			Autumn 2		
	Pure	Mechanics		Pure	Mechanics	
Unit of work	1. Proof 2. Algebraic and partial fractions Interleaving topics from AS 3. Functions and modelling 6. Trigonometry	4. Moments 5. Forces at any angle		4. Binomial Theorem 6 Trigonometry	6. Applications of kinematics	
Core Skills	AS Proof Algebraic fractions AS Algebraic division, factor theorem Vocabulary and f(x) notation for functions Composite, inverse and transformations of polynomial functions Knowledge of polynomial, trigonometric, exponential and logarithmic functions, including their graphs AS Transforming graphs Sine and cosine function Length of arc and area of sector Algebraic division, factor theorem	Basic equilibrium 2D trigonometry Cosine and sine rules (sin x)/(cos x) = tan x (to find the angle of the resultant) Basic vectors, magnitude and direction (kinematics) i, j vectors Force diagrams and assumptions		Series and sequences Knowledge of polynomial, trigonometric, exponential and logarithmic functions, including their graphs Algebraic fractions Algebraic division, factor theorem (See Unit 3a of the SoW) Binomial expansion of the form (a + bx)n , where n is a positive integer AS Transforming graphs Sine and cosine function Length of arc and area of sector Algebraic division, factor theorem Solving trigonometric equations ($\sin^2 x+\cos^2 x=1$ and (sin x)/(cos x)=tan x Properties of graphs of y = sin x, y = cos x and y = tan	i, j (2D) vectors Magnitude and direction of a vector Trigonometry suvat formulae Vertical motion under gravity i, j (2D) vectors (See Unit 8a of the SoW)	
	Pure			Pure	Mechanics	
Core Knowledge	Examples including proof by deduction* and proof by contradiction Simplifying algebraic fractions Partial fractions Arithmetic and geometric progressions (proofs of 'sum formulae') Sigma notation Recurrence and iterations Radians (exact values), arcs and sectors Small angles	Forces' turning effect Resolving forces Friction forces (including coefficient of friction μ)		Examples including proof by deduction* and proof by contradiction Simplifying algebraic fractions Partial fractions Arithmetic and geometric progressions (proofs of 'sum formulae') Sigma notation Recurrence and iterations Radians (exact values), arcs and sectors Small angles Secant, cosecant and cotangent (definitions, identities and graphs); Inverse trigonometrical functions; Inverse trigonometrical functions Compound* and double (and half) angle formulae *geometric proofs expected R cos (x ± α) or R sin (x ± α) Proving trigonometric identities Solving problems in context (e.g. mechanics)	Equilibrium and statics of a particle (including ladder problems)	
Assement & Feedback	Mini assessments at the end of each unit. Green feedback sheets with next step question for students to complete. The assessments and feedback sheets are kept in students' folder.			Mini assessments at the end of each unit. Green feedback sheets with next step question for students to complete. The assessments and feedback sheets are kept in students' folder.		
Link to prior learning	Core skills are reviewed as starters and set as homework to reinforce core knowledge			Core skills are reviewed as starters and set as homework to reinforce core knowledge		

	Spring 1			Spring 2		
	Pure	Mechanics	Statistics	Pure	Mechanics	Statistics
Unit of work	7. Parametric equations 8. Differentiation 9. Numerical methods	6. Applications of kinematics	1. Regression and correlation 2. Probability	10 Integration (part 1) 11. Integration (part 2)	8. Further kinematics	2. Probability 3. The Normal distribution
Core Skills	Trigonometric identities Knowledge of a variety of functions involving powers, roots, trigonometric functions, exponentials and logarithms Coordinate geometry Trigonometric identities Graphs, roots and functions Differentiation and integration	i, j (2D) vectors Magnitude and direction of a vector Trigonometry suvat formulae Vertical motion under gravity i, j (2D) vectors (See Unit 8a of the SoW)	Understanding of regression Understanding of correlation Mutually exclusive and independent events	Knowledge of exponentials and ln x Laws of logarithms Trigonometry Differentiation	Basic trigonometry, Pythagoras and vectors Find the magnitude and direction of vectors	Mutually exclusive and independent events Probability calculations, independent events Properties of the binomial distribution Probability is the area under a curve
	Pure	Mechanics		Pure	Mechanics	Statistics
Core Knowledge	Definition and converting between parametric and Cartesian forms Curve sketching and modelling Differentiating sin x and cos x from first principles Differentiating exponentials and logarithms Differentiating products, quotients, implicit and parametric functions. Second derivatives (rates of change of gradient, inflections) Rates of change problems Location of roots Solving by iterative methods Newton-Raphson method Problem solving	Dynamics of a particle	Change of variable Correlation coefficients Statistical hypothesis testing for zero correlation Using set notation for probability Conditional probability Questioning assumptions in probability	Integrating xn (including when n = −1), exponentials and trigonometric functions Using the reverse of differentiation, and using trigonometric identities to manipulate integrals Integration by substitution Integration by parts	Constant acceleration (equations of motion in 2D; the i, j system) Variable acceleration (use of calculus and finding vectors $\dot{r}$ and $\ddot{r}$ at a given time)	Conditional probability Questioning assumptions in probability Understand and use the Normal distribution Use the Normal distribution as an approximation to the binomial distribution Selecting the appropriate distribution Statistical hypothesis testing for the mean of the Normal distribution
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	Summer 1			Summer 2		
	Pure	Mechanics	Statistics	Pure	Mechanics	
Unit of work	11. Integration (part 2) 12. Vectors (3D)	Revisit gaps on Year 1 & 2 and practice exam papers	Revisit gaps on Year 1 & 2 and practice exam papers	Revisit gaps on Year 1 & 2 and practice exam papers	Revisit gaps on Year 1 & 2 and practice exam papers	
Core Skills	Laws of logarithms Trigonometry Partial fractions Differentiation AS Vectors					
	Pure	Mechanics	Statistics	**Pure**	**Mechanics**	
Core Knowledge	Use of partial fractions Areas under graphs or between two curves, including understanding the area is the limit of a sum (using sigma notation) The trapezium rule Differential equations (including knowledge of the family of solution curves) Use of vectors in three dimensions; knowledge of column vectors and i, j and k unit vectors		Use discrete distributions to model real-world situations; Identify the discrete uniform distribution; Calculate probabilities using the binomial distribution (calculator use expected) Language of hypothesis testing; Significance levels Carry out hypothesis tests involving the binomial distribution			
Assement & Feedback	Mini assessments at the end of each unit. Green feedback sheets with next step question for students to complete. The assessments and feedback sheets are kept in students' folder.			Mini assessments at the end of each unit. Green feedback sheets with next step question for students to complete. The assessments and feedback sheets are kept in students' folder.		
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