

Procedural knowledge (exam technique, skills etc):

- a: Accuracy
- b: Problem solving
- c: Logic
- d: Communication
- e: Interpretation
- f: Appropriate use of technology
- g:
- h: Diagram use
- i: Revision techniques
- j: Numeracy
- k: Units and dimensions

Across the entire curriculum thus not referenced subsequently

Across work set in all work outside of class due to synoptic nature of work set, and in progress days/interventions
Across the entire curriculum thus not referenced subsequently

Exam technique
Other procedural knowledge

No of lessons	Disciplinary Knowledge area	Disciplinary Knowledge Content	Disciplinary knowledge, that this interweaves with	Procedural knowledge progression	RS revision knowledge topic	HW focus and actions	Assessment (topic and skills assessed)	
1	Algebraic Expressions	Index laws Expanding brackets Factoring Negative and fractional indices Surd Rationalising denominators	Links with all future topics so not mentioned	b	Notes page	All homeworks synoptic and diagnostic	As homework column - synoptic AP as test; flexible AP as Assignment per half term	
5	Quadratics	Solving quadratic equations Completing the square Functions Quadratic graphs The discriminant Modelling with quadratics		b, d, f	Notes page Calculator procedures to identify k Recall the properties of the discriminant How to solve hidden quadratic (arg)			
4	Equations and inequalities	Linear simultaneous equations Quadratic simultaneous equations Simultaneous equations on graphs Linear inequalities Quadratic inequalities Inequalities on graphs Regions	Quadratics	b, c, f, h	Notes page How to identify strict vs non-strict i How to solve quadratic inequalities			
5	Graphs and transformations	Cubic graphs Quartic graphs Reciprocal graphs Points of intersection Translating graphs Stretching graphs Transforming functions	Equations and inequalities	f, h	Notes page Explain transformations of $a f(bx+c)$			
4	Straight line graphs	$y = mx + c$ Equations of straight lines Parallel and perpendicular lines Length and area Modelling with straight lines	Equations and inequalities	b, e, h	Notes page How to identify number of intersection process for finding centre and radius Centre finding given 3 points			
4	Circles	Midpoints and perpendicular bisectors Equation of a circle Intersections of straight lines and circles Use tangent and chord properties Circles and triangles	Quadratics Equations and inequalities Straight line graphs	b, e, h	Notes page How to identify which trig equation Sketch graphs Connecting graphs and CAST			
5	Algebraic methods	Algebraic fractions Dividing polynomials The factor theorem Mathematical proof Methods of proof	Quadratics Equations and inequalities	b, c, d	Notes page Explain how to prove by exhaustion explain how to divide polynomial Explain the factor theorem Explain when to use the factor theorem			
5	Binomial Expansion	Pascal's triangle Factorial notation The binomial expansion Solving binomial problems Binomial estimation		b, f	Notes page What useful formulae for the binomial How can you use a binomial expansion			
2	Trigonometric ratios	The cosine rule The sine rule Areas of triangles Solving triangle problems Graphs of sine, cosine and tangent Transforming trigonometric graphs	Graphs and transformations	b, k	Notes page Recall trigonometric identities how to solve a quadratic in trig			
5	Trigonometric identities and equations	Angles in all four quadrants Exact values of trigonometric ratios Trigonometric identities Simple trigonometric equations Harder trigonometric equations Equations and identities	Quadratics Equations and inequalities Graphs and transformations Trigonometric ratios	b, c, d	Notes page Application to constant velocity in a How to find the magnitude and direction			
5	Vectors	Vectors Representing vectors Magnitude and direction Position vectors Solving geometric problems Modelling with vectors		b, h, k	Notes page First principles How to identify type of stationary point			
9	Differentiation	Gradients of curves Finding the derivative Differentiating Differentiating quadratics Differentiating functions with two or more terms Gradients, tangents and normal Increasing and decreasing functions Second order derivatives Stationary points Sketching gradient functions Modelling with differentiation	Quadratics Equations and inequalities Graphs and transformations Straight line graphs	b, c, d, h, k				
6	Integration	Integrating Indefinite integrals Finding functions Definite integrals Areas under curves Areas under the x-axis Areas between curves and lines Exponential functions $y = e^x$ Exponential modeling Logarithms	Equations and inequalities Graphs and transformations Straight line graphs Differentiation	b, h				
12	Exponentials and Logarithms	Laws of logarithms Solving equations using logarithms Working with natural logarithms Logarithms and non-linear data	Quadratics Equations and inequalities Graphs and transformations Straight line graphs Differentiation	b, c, e, f, h				
4	Data Collection	Populations and samples Sampling Non-random sampling Types of data The large data set	(Large data set can be linked to any other statistics topic moving forwards)	d, e, f, k				
5	Measures of location and spread	Measures of central tendency Other measures of location Measures of spread Variance and standard deviation Coding		f, k				
3	Representations of data	Outliers Box plots Cumulative frequency Histograms Comparing data	Data Collection Measures of location and spread	d, e, f, h				
2	Correlation	Correlation Linear regression	Measures of location and spread	d, e				
2	Probability	Calculating probabilities Venn diagrams Mutually exclusive and independent events Tree diagrams		b, e, h				
2	Statistical distributions	Probability distributions The binomial distribution Cumulative probabilities	Binomial Expansion Probability	b, e, f				
3	Hypothesis testing	Hypothesis testing Finding critical values One-tailed tests Two-tailed tests	Statistical distributions	b, c, d, e, h				
3	Modelling in mechanics	Constructing a model Modelling assumptions Quantities and units Working with vectors	Vectors	d, e, h, k				
3	Constant acceleration	Displacement-time graphs Velocity-time graphs Constant acceleration formulae 1 Constant acceleration formulae 2 Vertical motion under gravity	Quadratics Straight line graphs Modelling in mechanics	b, h, k				
5	Forces and motion	Force diagrams Forces as vectors Forces and acceleration Motion in 2 dimensions Connected particles Pulley	Modelling in mechanics Constant acceleration	b, d, e, h, k				
3	Variable acceleration	Functions of time Using differentiation Maxima and minima problems Using integration Constant acceleration formulae	Differentiation Integration Modelling in mechanics Constant acceleration	b, e, k				
	No of lessons	Disciplinary Knowledge area	Disciplinary Knowledge Content	Disciplinary knowledge, that this interweaves with (excluding V12 content)	Procedural knowledge progression	RS revision knowledge topic	HW focus and actions	Assessment (topic and skills assessed)
			Proof by contradiction Algebraic fractions				All homeworks synoptic and diagnostic	As homework column - synoptic AP as test; flexible AP as

6	Algebraic methods	Partial fractions Repeated factors Algebraic division			b,c,d
	Functions and graphs	The modulus function Functions and mappings Composite functions Inverse functions $y=f(x)$ and $y=f^{-1}(x)$ Combining transformations Solving modulus problems			b,d,e,f,h
6	Sequences and series	Arithmetic sequences Arithmetic series Geometric sequences Geometric series Sum to infinity Sigma notation Recurrence relations Modelling with series	Algebraic methods		b,d,e,f,h
6	Binomial expansion	Expanding $(1+x)^n$ Expanding $(a+bx)^n$ Using partial fractions	Algebraic methods		b,e
3	Radians	Radian measure Arc length Areas of sectors and segments Solving trigonometric equations	Algebraic methods		b
4	Trigonometric functions	Small angle approximations Secant, cosecant and cotangent Graphs of $\sec x$, $\csc x$ and $\cot x$ Using $\sec x$, $\csc x$ and $\cot x$ Trigonometric identities Inverse trigonometric functions	Algebraic methods Functions and graphs Radians		b,h,k
4	Trigonometry and modelling	Addition formulae Using the angle addition formulae Double-angle formulae Solving trigonometric equations Simplifying $a \cos x + b \sin x$ Proving trigonometric identities Modelling with trigonometric functions	Algebraic methods Functions and graphs Radians Trigonometric functions		b,c,f,h
7	Parametric equations	Parametric equations Using trigonometric identities Curve sketching Points of intersection Modelling with parametric equations	Algebraic methods Functions and graphs Radians Trigonometric functions		b,c,f,h
5	Differentiation	Differentiating $\sin x$ and $\cos x$ Differentiating exponentials and logarithms The chain rule The product rule The quotient rule Differentiating trigonometric functions Parametric differentiation Implicit differentiation Using second derivatives Rules of change Locating roots	Algebraic methods Functions and graphs Radians Trigonometric functions Trigonometry and modelling		b,f,h,k
9	Numerical methods	Iteration The Newton-Raphson method Applications to modelling Integrating standard functions Integrating $f(ax+b)$ Using trigonometric identities Reverse chain rule Integration by substitution Integration by parts Partial fractions Finding areas The trapezium rule Solving differential equations Modelling with differential equations	Parametric equations		c,d,e,h,k
4	Integration	Integration by substitution Integration by parts Partial fractions Finding areas The trapezium rule Solving differential equations Modelling with differential equations	Differentiation		c,f,h
10	Vectors	3D coordinates Vectors in 3D Solving geometric problems Application to mechanics	Algebraic methods Radians Trigonometric functions Trigonometry and modelling Parametric equations Differentiation		f,h,k
2	Regression, correlation and hypothesis test	Exponential models Measuring correlation Hypothesis testing for zero correlation			b,d,e,h,k
3	Conditional probability	Set notation Conditional probability Conditional probabilities in Venn diagrams Probability formulae Tree diagrams			d,e
3	Normal distribution	The normal distribution Finding probabilities for normal distributions The inverse normal distribution function The standard normal distribution Finding μ and σ Approximating a binomial distribution Hypothesis testing with the normal distribution	Regression, correlation and hypothesis testing Conditional probability		b,c,d,e,h
7	Moments	Moments Resultant moments Equilibrium Centres of mass Tilting			b,h,k
4	Forces and friction	Resolving forces Inclined planes Friction			b,h,k
2	Projectiles	Horizontal projection Horizontal and vertical components Projection at any angle Projectile motion formulae	Moments		b,h,k
3	Applications of forces	Static particles Modelling with statics Friction and static particles Static rigid bodies Dynamics and inclined planes Connected particles			b,h,k
4	Further Kinematics	Vectors in kinematics Vector methods with projectiles Variable acceleration in one dimension Differentiating vectors Integrating vectors	Parametric equations Differentiation Integration Projectiles		b,h,k