Year 12 Group Tutoring Schedule (August 2026- June 2027)

Phase 1: Pure Mathematics Schedule (Late August - Easter)					
Week	**Timeline**	**Core Topic Block**	**Checklist Subtopics Covered**	**Session Core Focus & High-Stakes Concepts**	**Edexcel Exam Strategy & Pitfalls**
Week 1	Late August	Algebraic Expressions	1.1 - 1.6: Indices, surds, expanding/factorising, rationalising denominators.	Establishing algebraic baselines, negative/fractional index laws, complex surds manipulation.	Ensure exact forms are maintained; watch for signs when expanding multi-bracket expressions.
Week 2	Early Sept	Quadratics	2.1 - 2.6: Solving quadratics, completing the square, quadratic graphs, functions.	Completing the square form a(x+b)^2+c, transforming roots, identifying turning points visually.	Students frequently misinterpret the vertex coordinates from completed square forms.
Week 3	Mid Sept	The Discriminant	2.5 - 2.6: The discriminant (b^2-4ac), roots condition modeling.	Deep dive into hidden/disguised quadratics (e.g. quartic forms) and roots analysis via b^2-4ac.	Setting up inequalities for b^2-4ac > 0 or < 0 where tracking critical values is highly prone to errors.
Week 4	Late Sept	Equations & Inequalities	3.1 - 3.3: Linear/quadratic simultaneous equations, intersections.	Analytical methods vs graphical intersections; solving multi-variable non-linear systems.	Be meticulous with algebraic substitutions; check both sets of x and y values in non-linear pairs.
Week 5	Early Oct	Inequalities & Regions	3.4 - 3.7: Linear & quadratic inequalities, graphical inequalities, regions.	Defining and shading regions on coordinate axes, finding exact critical boundary values.	Flipping inequality signs when multiplying or dividing by negative values.
Week 6	Mid Oct	Graphs & Intersections	4.1 - 4.4: Cubic, quartic, and reciprocal graphs, intersection points.	Sketching polynomials, behavior at asymptotic curves, tracking exact coordinate intersections.	Always mark asymptotes with clear dashed lines and write equations for coordinates of intersections.

Week 7	Late Oct	Functions Transformations	4.5 - 4.7: Translating, stretching, and transforming functions.	Mapping f(x) to f(x+a), f(ax), af(x), f(x)+a; tracking moving coordinates and vertices.	Inverting horizontal stretches/translations (e.g. f(2x) scales x by 1/2).
Week 8	Early Nov	Straight Line Graphs	5.1 - 5.5: y=mx+c, equations, parallel/perpendicular lines, length & area.	Coordinate calculations, proving perpendicular gradients (m1*m2 = -1), finding bounded polygon areas.	Double check fractional gradient inverses; use sketch maps to clarify triangle base/height lengths.
Week 9	Mid Nov	Circle Geometry Basics	6.1 - 6.2: Midpoints, perpendicular bisectors, circle equations.	Formulating circle equations from center and radius: (x-a)^2 + (y-b)^2 = r^2 via completing square.	Completing squares for both x and y terms perfectly without skipping steps.
Week 10	Late Nov	Circle Theorems & Intersections	6.3 - 6.5: Intersections of lines/circles, tangent and chord properties.	Proving lines as tangents via discriminant = 0, using perpendicularity from circle center to chord.	Heavy algebraic stamina required for substitutions. Keep calculations exact.
Week 11	Early Dec	Algebraic Fractions & Division	7.1 - 7.2: Simplifying fractions, polynomial long division.	Long division protocols for polynomials, expressing remainders correctly over divisors.	Watch for missing terms in dividends (e.g. insert 0x^2 for x^3 + 4x - 1).
Week 12	Mid Dec	The Factor Theorem & Proof	7.3 - 7.5: Factor theorem, formal mathematical proofs.	Deductive proof, exhaustion, disproof by counter-example; finding roots using f(k)=0.	Proof demands logical notation. Write concluding statements like 'Hence proved' explicitly.
Week 13	Late Dec	Mid-Year Synoptic Review	Topics 1 - 7 Synoptic Assessment	Exam-condition practice blending algebra, coordinate geometry, and polynomials.	Focus heavily on multi-step problems that weave distinct pure topics together.
Week 14	Early Jan	The Binomial Expansion	8.1 - 8.5: Pascal's triangle, factorial notation, binomial expansion.	Expanding (a+bx)^n for positive integers, finding single targeted coefficients quickly.	Remember to raise the entire term (bx) to the power, not just x (e.g. (3x)^2 = 9x^2).
Week 15	Mid Jan	Trigonometric Ratios	9.1 - 9.4: Sine/Cosine rules, area of triangles, 3D triangle problems.	Applying advanced trigonometry to multi-stage 2D/3D shapes, bearings, and structural modeling.	The ambiguous case of the sine rule can yield two valid angle solutions; evaluate context carefully.

Week 16	Late Jan	Trigonometric Graphs	9.5 - 9.6: Graphs of sin/cos/tan, transforming trigonometric functions.	Periodicity and transformations of circular function curves, identifying new intercepts.	Keep track of shifting asymptotes on tan graphs under horizontal scaling transformations.
Week 17	Early Feb	Trig Identities	10.1 - 10.3: Four quadrants, exact values, fundamental identities.	Mastering CAST diagram / symmetry, and utilizing sin^2+cos^2=1 and tan=sin/cos.	Always state which identity is being substituted to protect method marks.
Week 18	Mid Feb	Trigonometric Equations	10.4 - 10.6: Simple and harder quadratic-style trig equations.	Solving equations within constrained intervals, managing hidden quadratic trigonometric forms.	Dividing by a trig function destroys valid root solutions; factorize instead.
Week 19	Late Feb	Vectors (2D)	11.1 - 11.6: Vector representation, magnitude/direction, position vectors, geometric proofs.	Column vectors, i/j notation, finding unit vectors, resolving tracking paths geometric proofs.	Clearly denote vectors using underlines or bold script; distinguish position vs displacement vectors.
Week 20	Early Mar	Differentiation Principles	12.1 - 12.5: Differentiation from first principles, differentiating x^n.	Formal limit definitions of derivatives, executing power rules on polynomial terms.	Ensure fractional and negative powers are accurately converted before differentiating.
Week 21	Mid Mar	Tangents, Normals & Turning Points	12.6 - 12.9: Gradients, tangents, normals, stationary points.	Finding exact tangent/normal equations, evaluating stationary points where dy/dx = 0.	The normal gradient is the negative reciprocal of the tangent gradient (-1 / m).
Week 22	Late Mar	Advanced Calculus Optimization	12.10 - 12.11: Sketching gradient functions, optimization modeling.	Setting up geometric/physical optimization equations, finding global extrema via d^2y/dx^2.	Always explicitly justify the maximum/minimum nature using the second derivative sign test.
Week 23	Early Apr	Integration Fundamentals	13.1 - 13.4: Integrating x^n, indefinite integrals, definite integrals.	Reverse of differentiation, calculating the arbitrary constant c via given boundary coordinates.	Never forget to include the '+ c' integration constant on indefinite integrals.
Week 24	Mid Apr	Areas Under Curves & Logs Intro	13.5 - 13.7: Definite integrals, area bounded by curves, lines, axes.	Evaluating definitive integrals to calculate precise area shapes under curves or lines.	Areas below the x-axis yield negative values; split integrals at the x-axis intercepts.

Phase 2: Applied Mathematics Schedule (Post-Easter - June)					
Week	**Timeline**	**Core Topic Block**	**Checklist Subtopics Covered**	**Session Core Focus & High-Stakes Concepts**	**Edexcel Exam Strategy & Pitfalls**
Week 25	Late Apr	Data Collection & Sampling (Stats)	S1.1 - S1.5: Populations, sampling techniques, Large Data Set.	Evaluating random/non-random sampling bugs, structural knowledge of the Edexcel Large Data Set.	Be ready for wordy questions on LDS location metrics, data constraints, or missing data logs.
Week 26	Early May	Data Representation & Summaries	S2.1 - S2.5, S3.1 - S3.5: Measures of location/spread, coding, plots, histograms.	Analyzing variance/standard deviation formulas, calculating histograms with uneven class widths.	Coding affects the mean directly, but has absolutely zero impact on measures of spread like SD.
Week 27	Mid May	Correlation & Probability	S4.1 - S4.2, S5.1 - S5.4: Linear regression, Venn diagrams, tree diagrams, independence.	Interpreting regression line constants in context, independent/mutually exclusive condition laws.	Extrapolation warning: never use a regression line to predict data outside its original boundary values.
Week 28	Late May	Binomial & Hypothesis Testing	S6.1 - S6.3, S7.1 - S7.4: Binomial distribution, hypothesis tests, critical values.	Formulating precise null/alternative hypotheses, computing 1-tailed and 2-tailed tests.	Always contextually write your test conclusion. Match the exact language of the question prompt.
Week 29	Early June	Kinematics Basics & SUVAT (Mech)	M8.1 - M8.4, M9.1 - M9.5: Modeling assumptions, SUVAT equations, graphs.	Deriving and applying constant acceleration formulas, handling vertical freefall gravity models.	Set up a consistent positive directional vector before calculating SUVAT parameters.
Week 30	Mid June	Dynamics & Forces	M10.1 - M10.4: Force diagrams, Newton's laws, F=ma, 2D force vectors.	Resolving force vectors systematically on horizontal lines using Newton's second law framework.	F=ma is a directional vector component layout. Track friction and thrust signs carefully.

Week 31	Late June	Connected Particles & Pulleys	M10.5 - M10.6: Connected systems, trailers, vertical pulley rigs.	Setting up simultaneous equations of motion for inter-connected items across systems.	State standard assumptions clearly (e.g. inextensible string means acceleration is identical).
Week 32	End June	Variable Acceleration	M11.1 - M11.5: Functions of time, calculus application in mechanics.	Using differentiation/integration to shift between displacement, velocity, and acceleration profiles.	Total distance tracking requires solving v=0 to capture directional turnbacks perfectly.

Year 13 Group Tutoring Schedule (August 2026- June 2027)

Phase 1: Pure Mathematics Schedule (Late August - Mid-February)

Week	Timeline	Core Topic Block	Checklist Subtopics Covered	Session Core Focus & High-Stakes Concepts	Edexcel Exam Strategy & Pitfalls
Week 1	Late August	Foundations of Proof	1.1, 1.2: Proof by contradiction, Algebraic functions.	Contradiction parameter logic setups (p => q), identifying structural rational assumptions.	Ensure parameters are fully set at the start; watch for algebraic steps with roots.
Week 2	Early Sept	Partial Fractions	1.3, 1.4, 1.5: Linear factors, repeated roots, algebraic division.	Decomposing fractions into partial form components to baseline future heavy integration.	Check constants setup matching repeated roots carefully; avoid basic bracket errors.
Week 3	Mid Sept	Functions & Mappings	2.2, 2.3, 2.4: Domain/range, composite & inverse operations.	Understanding mappings, defining 1:1 conditions essential for structural inverse existence.	Always compute and clearly specify matching input/output domain intervals for inverses.
Week 4	Late Sept	Modulus Functions	2.1, 2.5, 2.6, 2.7: Modulus graphs, combined transformations.	Solving complex modulus inequalities via analytical systems and intersections.	Draw thorough sketches to verify true intersections vs extraneous fake solutions.
Week 5	Early Oct	Arithmetic Series	3.1, 3.2, 3.6: Arithmetic progressions, Sn sum formula proof.	Rigorous formal algebraic proof of the Sn summation series; parsing Sigma limits.	Track starting indices in Sigma notation; do not blindly assume limits begin at 1.
Week 6	Mid Oct	Geometric Series	3.3, 3.4, 3.5, 3.7, 3.8: Geometric rules, sum to infinity, modeling.	Tracking convergence intervals where |r| < 1, recurring sequences, investment modeling.	Real-world modeling shifts time indexing milestones; construct steps carefully.
Week 7	Late Oct	Binomial Expansion	4.1, 4.2: Infinite expansions with fractional/negative powers.	Expanding using general (1+x)^n layouts; validating range parameters thoroughly.	Factor out 'a' correctly to maintain structural validity constraints (|x| < |a/b|).
Week 8	Early Nov	Advanced Series Links	4.3, 4.4, 8.1, 8.3: Series with partial fractions, parametrics introduction.	Combining fraction decomposition with infinite series expansions; plotting parametric paths.	Ensure multi-term binomial formats share overlapping intervals of absolute convergence.
Week 9	Mid Nov	Radians & Small Angles	5.1 - 5.5: Arc lengths, sector geometry, small angle bounds.	Shedding degree habits; implementing key limits for sin/cos/tan near zero.	Approximations are strictly valid in radians; track correct algebraic powers of theta.

Week 10	Late Nov	Reciprocal Trig Curves	6.1, 6.2, 6.4, 6.5: Sec, cosec, cot graphs, inverse trig bounds.	Charting asymptotic behavior of modern reciprocal waves; restricted primary domain bounds.	Inverse trig paths output specific unique angles within principal range boundaries.
Week 11	Early Dec	Compound Angle Rules	7.1, 7.2, 7.3, 7.6: Addition formulas, double angles, identity proofs.	Deriving multi-angle trigonometric configurations, step-by-step structural proofs.	Keep target expressions clear in proof lines; make intentional double-angle choices.
Week 12	Mid Dec	Harmonic Wave Form	7.5, 7.7, 8.2: R-formula configuration, parameter elimination.	Condensing compound waveforms into single cosine paths to pinpoint absolute max/min states.	Verify correct sign mappings (+/- alpha) when solving real wave modeling setups.
Week 13	Early Jan	Calculus: Core Differentiation	9.1 - 9.4: Derivative principles, exponentials, logs, product/chain rules.	Securing structural automaticity for complex functional composites differentiation.	Expose and write out 'u' and 'v' parameters distinctly before product steps.
Week 14	Mid Jan	Calculus: Advanced Methods	9.5 - 9.8: Quotient rule, reciprocal trig, parametric & implicit tracks.	Deriving secondary trig curves; setting up tangents/normals to implicit shapes.	Take caution with product groupings embedded inside multi-variable implicit parts.
Week 15	Late Jan	Rates of Change & Roots	9.9, 9.10, 10.1, 10.2: Connected rates, sign changes, iterative loops.	Chaining derivatives with the Chain Rule; diagnosing step-by-step root convergence.	Sign-change tests fail across non-continuous points; track local asymptotes safely.
Week 16	Early Feb	Newton-Raphson & Integration	10.3, 10.4, 11.1, 11.2, 11.4: Newton tracking, reverse chain calculus.	Recognizing Newton failures near stationary peaks; standard integration patterns.	Newton-Raphson completely breaks down if any initial point hits an inflection/turning zone.
Week 17	Mid Feb	Advanced Integration Rules	11.3, 11.5, 11.6, 11.7: Substitution, by-parts method, rational fractions.	Transforming boundary limits properly under substitution; integrating natural logs.	Always swap out dx parameters instantly into du equivalents; transform limits.
Week 18	Late Feb	Differential Equations & 3D Vectors	11.10, 11.11, 12.1, 12.2, 12.3: Variable separation, 3D vector spaces.	Modeling rates from written problem descriptions; resolving geometry in 3D grid fields.	Never omit the initial integration constant (+C); apply initial boundaries instantly.

Phase 2: Applied Mathematics Schedule (Mid-February - Easter)

Week	Timeline	Core Topic Block	Checklist Subtopics Covered	Session Core Focus & High-Stakes Concepts	Edexcel Exam Strategy & Pitfalls
Week 19	Mid Feb	Advanced Regression	1.1, 1.2, 1.3: Linearized log models, PMCC significance tests.	Interpreting sample correlation metrics, structuring alpha value test metrics.	Do not predict values outside measured intervals; extrapolate with extreme caution.
Week 20	Late Feb	Conditional Probability	2.1 - 2.5: Set notation conditional, tree diagrams, Venn sample space.	Deconstructing compound contextual scenarios into explicit mathematical subsets.	Ensure denominator samples isolate the conditioned sub-space properly.
Week 21	Early Mar	Normal Distribution: Core	3.1, 3.2, 3.3: Continuous curves, inverse normal properties.	Symmetry modeling, locating target thresholds from custom probability metrics.	The standard model Z always anchors precisely at mean=0 with standard deviation=1.
Week 22	Mid Mar	Normal Distribution: Testing	3.4, 3.5, 3.7: Unknown means, sample mean significance tests.	Applying sample adjustments to adjust variance parameters for group samples.	Formulate null and alternate models around population parameter mu, never x-bar.
Week 23	Late Mar	Kinematics & Calculus	8.3, 8.4, 8.5: Variable 1D systems, 2D vector calculus integrals.	Moving fluidly between position, velocity, and acceleration matrices using calculus.	Constants of integration track starting initial states; compute them immediately.
Week 24	Early Apr	Projectiles: Core Concepts	6.1, 6.2, 6.3: Projections from heights, components parsing.	Decoupling constant sideways speed vectors from acceleration drops under gravity.	Maintain strict uniform coordinate sign orientations across horizontal/vertical axes.
Week 25	Mid Apr	Projectiles: Advanced Paths	6.4, 8.1, 8.2: Formula derivations, Cartesian trajectory models.	Tracking trajectories analytically over time coordinates using i, j notation blocks.	Calculated speed is the scalar vector magnitude; solve via Pythagoras theorem steps.
Week 26	Late Apr	Moments: Rigid Beams	4.1, 4.2, 4.3: Perpendicular spacing rules, beam balance equilibrium.	Resolving complex systems by applying static equilibrium laws across focal points.	State your selected turning point explicitly to maintain accurate sign patterns.
Week 27	Early May	Moments: Tilting Models	4.4, 4.5: Non-uniform structures, imminent tilting criteria.	Tracking the exact balance limits where supporting reaction forces drop down to zero.	Imminent tilt criteria forces the counter-reaction force parameter to equal zero.

Week 28	Mid May	Friction Mechanics	5.1, 5.2, 5.3: Resolving angled planes, limiting friction equations.	Analyzing the exact point where static resistance transfers into live kinetic slides.	Friction only reaches maximum mu*R at limiting threshold states; otherwise F <= mu*R.
Week 29	Late May	Statics & Dynamic Slopes	7.1, 7.2, 7.3, 7.5: Friction on slopes, F = ma directional nets.	Balancing force arrays parallel and perpendicular to tilted coordinate baselines.	Verify acceleration directions clearly before structuring net equation lines.
Week 30	Early June	Connected Slopes & Ladders	7.4, 7.6: Ladder friction networks, multi-string pulley mechanics.	Setting up simultaneous equations across linked particle structures or wall joints.	Wall contact points introduce independent reaction forces; draw diagrams neatly.