

Curriculum Plan

Year: 12 (AS level)

Subject: Pure Mathematics P2(WMA12/01)

Term	Week	Focus	Summary	Learning Outcomes	Parental Support	Independent Learning
1 A	1-2	Algebraic Methods	Review of algebraic fractions and division of a polynomial by a linear factor. Use the factor theorem to factorise a cubic expression. Use of the remainder theorem.	Students will be able to apply the factor and remainder theorems to examples especially cubic expressions.	Encourage review of prior algebraic skills, especially polynomial division and solving simultaneous equations.	Complete designated textbook exercises (Ex 1A, 1B, 1C and 1D). Practice factorisation and finding the remainder using algebraic division.
			Construct mathematical proofs using algebra. Use proof by exhaustion and disproof by counter example.	Students will be able to prove a mathematical statement is true by exhaustion and not true by a counter example.	Discuss the importance of algebraic accuracy and systematic working for proofs.	Work through varied examples from Ex 1E and 1F. Re-attempt challenging problems.

	3-4	Coordinate Geometry in the (x,y) Plane	Equations of straight lines, including perpendicular and parallel lines, and equations of circles in various forms.	Students will be able to find equations of lines and circles, and understand their properties.	Review basic coordinate geometry concepts (gradient, distance, mid-point) from GCSE.	Practice finding equations of lines and circles. Complete designated textbook exercises (Ex 2A, 2B, and 2C).
			Intersections of lines and circles, and finding tangents and normals to circles. Circles and triangles.	Students will be able to find intersection points and determine equations of tangents and normals to circles. Find the angle in a semicircle and solve problems involving circles and triangles.	Provide a quiet study environment for problem-solving. Encourage visualization of geometric shapes.	Solve intersection problems. Practice using exercises 2D, 2E and 2F.
	5	Exponentials and Logarithms	Review of laws of indices and logarithms; solving basic exponential and logarithmic equations. Changing the base of a logarithm.	Students will be able to apply the laws of logarithms to simplify expressions and solve simple exponential/logarithmic equations.	Reinforce the relationship between exponential and logarithmic forms.	Practice converting between exponential and logarithmic forms. Solve equations without a calculator. Textbook exercises: 3A -3E.
	6	The Binomial Expansion	Binomial expansion for $(1+x)^n$ for any rational n , and for $(a+bx)^n$. Understanding its derivation and use of Pascal's triangle.	Students will be able to expand binomial expressions for positive integer powers.	Encourage memorization of the binomial formula and understanding its application.	Practice expanding expressions, identifying coefficients using factorial notation, and determining the first few terms. Solve problems involving

			Make approximations using the Binomial expansion.			approximations. Textbook exercises: 4A-4E.
	7	Review Exercise 1	Begin Review Exercise 1 covering Chapters 1-4.		Help ensure they're checking their answers for Review Exercise 1.	Attempt Review Exercise 1 questions independently, identifying weak areas.

Term	Week	Focus	Summary	Learning Outcomes	Parental Support	Independent Learning
1B						
	8-9	Sequences and Series	<p>Arithmetic sequences and series: understanding the nth term, sum of n terms, and problem-solving using these formulas.</p> <p>Geometric sequences and series: understanding the nth term, sum of n terms, and the sum to infinity for convergent series.</p>	<p>Students will be able to identify arithmetic sequences/series and calculate terms and sums. Students will be able to identify geometric sequences/series, calculate terms/sums, and determine conditions for sum to infinity.</p> <p>Students will be able to use sigma notation to describe series, generate sequences from recurrence relations and model real-life situations with sequences and series.</p>	<p>Discuss practical examples of sequences (e.g., salaries increasing by fixed amount). Discuss real-world examples (e.g., compound interest, bouncing ball heights).</p>	<p>Practice deriving formulas and solving word problems involving arithmetic progressions. Exercises: 5A and 5B.</p> <p>Work through examples with both finite and infinite geometric series. Exercises: 5C, 5D, and 5E.</p> <p>Exercises: 5F, 5G, 5H and 5I.</p>

			Sigma notation, recurrence relations and modelling with series.			
10	Trigonometric Identities and Equations	<p>Review of basic trigonometric. Calculate the sine, cosine and tangent of any angle in the four quadrants. Simple identities with sine and cosine. Solving simple trigonometric equations involving various identities. Solve more complicated trig. equations of the form $\sin(n\theta) = k$ and $\sin(\theta) = k$ and equivalent equations involving cos and tan.</p>	<p>Students will be able to manipulate and prove trigonometric identities using established results. Students will be able to solve trigonometric equations within a given range, using appropriate identities.</p>	<p>Encourage systematic approach to proofs and memorization of key identities. Provide a conducive study environment; encourage consistent practice in solving equations.</p>	<p>Practice proving identities. Create flashcards for trigonometric formulae. Exercises: 6A – 6D. Solve a variety of trigonometric equations. Pay attention to general solutions and specific ranges. Exercises: 6E - 6F.</p>	
	Differentiation	<p>Review of basic differentiation. Increasing and</p>	<p>Students will be able to identify increasing and decreasing functions. Find stationary</p>	<p>Encourage careful application of differentiation rules</p>	<p>Practice finding increasing and decreasing</p>	

	11		decreasing functions. Stationary points and their nature. Sketch gradient function. Model real-life situations with differentiation.	points and determine their nature. Sketch gradient function of a given function and model real-life situations with differentiation.	and attention to detail.	functions, stationary points and 2 nd differentials, sketching graphs and gradient functions and modelling questions involving differentiation. Exercises: 7A – 7D.
	12	Integration	Review integration as the reverse of differentiation. Evaluate definite integrals and use the same to determine areas. Trapezium rule to find approx. areas.	Students will be able to evaluate a definite integral, find areas under a curve and those bounded by a curve and a straight line and two curves and use the trapezium rule to approximate areas.	Discuss the concept of anti-derivatives and the constant of integration.	Practice indefinite integrals and finding areas using integration. Exercises: 8A – 8F.
	13	Review Exercise 2 and Revision	Comprehensive review of Chapters 5-8 and overall P2 syllabus through textbook review questions. Targeted revision of weaker areas.	Students will consolidate their understanding and improve problem-solving skills across the entire P2 syllabus.	Encourage active participation in review sessions and discussion of challenging problems.	Attempt Review Exercise 2 questions under timed conditions. Review topics where errors were made.

	14	Mock Exam: practice, review and assessment	Mock exams, full past paper under timed conditions. Review and assessment of performance.	Students will refine their exam technique, improve time management, and build confidence for the final P2 examination.	Ensure a balanced routine, encourage breaks, and adequate sleep.	Work through full past papers, focusing on exam technique (time management, showing appropriate workings). Revisit challenging topics.
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