Unit C2
Pure Mathematics 2

Candidates will be expected to be familiar with the knowledge, skills and understanding implicit in Unit Cl.

	Topics	Notes
1.	Sequences, including those given by a formula for the *n*th term and those generated by a simple relation of the form $x_{n+1} = \mathrm{f}(x_n)$.	
	Arithmetic series. The sum of a finite arithmetic series. The sum of the first n natural numbers.	Use and proof of $S_n = \frac{n}{2}[2a + (n-1)d]$ and $S_n = \frac{n}{2}[a + l]$.
	Geometric series. The sum of a finite geometric series. The sum to infinity of a convergent geometric series.	Use and proof of $S_n = \frac{a(1-r^n)}{1-r}$. Use of $S_\infty = \frac{a}{1-r}$ for $\lvert r \rvert < 1$. The Σ notation.
2.	$y = a^x$ and its graph.	Use of the result that $y = a^x$ implies $x = \log_a y$.
	Laws of logarithms. $\log_a x + \log_a y = \log_a (xy)$ $\log_a x - \log_a y = \log_a (x/y)$ $k \log_a x = \log_a (x^k)$	Proof of the laws of logarithms. Use of the laws of logarithms. e.g. Simplify $\log_2 36 - 2\log_2 15 + \log_2 100$. Change of base will not be required.
	The solution of equations in the form $a^x = b$.	The use of a calculator to solve equations such as (i) $3^x = 2$, (ii) $25^x - 4\times 5^x + 3 = 0$.

	Topics	Notes
3.	Coordinate geometry of the circle using the equation of a circle in the form $(x - a)^2 + (y - b)^2 = r^2$ (and in the form $x^2 + y^2 + 2gx + 2fy + c = 0$), and including use of the following circle properties: (i) the angle in a semicircle is a right-angle; (ii) the perpendicular from the centre to a chord bisects the chord; (iii) the perpendicularity of radius and tangent.	Equations of tangents. Condition for two circles to touch internally or externally. To include finding the points of intersection or the point of contact of a line and a circle.
4.	The sine and cosine rules, and the area of a triangle in the form $\frac{1}{2}ab\sin C$.	To include the use of the sine rule in the ambiguous case. Use of the exact values of the sine, cosine and tangent of 30°, 45° and 60°.
	Radian measure. Arc length, area of sector and area of segment.	
	Sine, cosine and tangent functions. Their graphs, symmetries and periodicity.	
	Knowledge and use of $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$ and $\cos^2\theta + \sin^2\theta = 1$.	
	Solution of simple trigonometric equations in a given interval.	To include the solution of equations such as $3\sin\theta = 1$, $\tan\dfrac{\theta}{2} = \sqrt{3}$ and $2\cos^2\theta + \sin\theta - 1 = 0$.
5.	Indefinite integration as the reverse of differentiation.	
	Integration of x^n $(n \neq -1)$.	Including sums, differences and polynomials.
	Approximation of area under a curve using the trapezium rule. Interpretation of the definite integral as the area under a curve. Evaluation of definite integrals.	No consideration of error terms will be required in the examination. To include finding the area of a region between a straight line and a curve.