

DATE	TOPIC	CONTENT	F	ASSESSMENT	Date Completed	% Completed
TERM 1		2023 Pace Setter		2 TASKS FOR TERM 1		
Week 1 11/1 – 13/1 (3 days)	Number Patterns , Sequence & Series	<ul style="list-style-type: none"> Patterns: Revise number patterns leading to those where there is a constant second difference between consecutive terms, and the general term is therefore quadratic. 				4%
Week 2 16/1 – 20/1	Number Patterns , Sequence & Series	1. Number patterns, including arithmetic and geometric sequences and series				8%
Week 3 23/1 – 27/1	Number Patterns , Sequence & Series	2. Sigma notation 3. Derivation and application of the formulae for the sum of arithmetic: 3.1 $S_n = \frac{n}{2}[2a + (n - 1)d]$; $S_n = \frac{n}{2}(a + l)$	F	Investigation / Project		12%
Week 4 30/1 – 03/2	Number Patterns , Sequence & Series	3. Derivation and application of the formulae for the sum of geometric series: 3.2 $S_n = \frac{a(r^n - 1)}{r - 1}; (r \neq 1);$ and 3.3 $S_n = \frac{a}{1 - r}; (-1 < r < 1), (r \neq 1)$				15%
Week 5 06/2 – 10/2	Functions: Formal Definition , Inverse, exponential and logarithmic	1. Definition of a <i>function</i> . 2. General concept of the <i>inverse of a function</i> and how the domain of the function may need to be restricted (in order to obtain a one-to-one function) to ensure that the inverse is a function. 3. Determine and sketch graphs of the inverses of the functions defined by $y = ax + q$; Focus on the following characteristics: domain and range, intercepts with the axes, turning points, minima, maxima, asymptotes (horizontal and vertical), shape and symmetry, average gradient (average rate of change), intervals on which the function increases /decreases.				19%

Week 6 13/2 – 17/2	Functions: Formal Definition, Inverse, exponential and logarithmic	4. Determine and sketch graphs of the inverses of the functions defined by $y = ax^2$ Focus on the following characteristics: domain and range, intercepts with the axes, turning points, minima, maxima, asymptotes (horizontal and vertical), shape and symmetry, average gradient (average rate of change), intervals on which the function increases /decreases.				23%
Week 7 20/2 – 24/2	Functions: Formal Definition, Inverse, exponential and logarithmic	5. Revision of the exponential function and the exponential laws and graph of the function defined by $y = b^x$ where $b > 0$ and $b \neq 0$ 6. Understand the definition of a logarithm: $y = \log_b x \Leftrightarrow x = b^y$ where $b > 0$ and $b \neq 1$ 7. The graph of the function, $y = \log_b x$ for both the cases $0 < b < 1$ and $b > 1$.				27%
Week 8 27/2 – 03/3	Trigonometry	1. Compound angle identities: $\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \sin \beta \cos \alpha$ $\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \pm \sin \alpha \sin \beta$				31%
Week 9 06/3 – 10/3	Trigonometry	$\sin 2\alpha = 2 \sin \alpha \cos \beta$ $\cos 2\alpha = \cos^2 \alpha - \sin^2 \alpha$ $= 2 \cos^2 \alpha - 1$ $= 1 - 2 \sin^2 \alpha$	F	Test		35%
Week 10 13/3 – 17/3	Trigonometry	2. Revise the proof of the sine, cosine and area rules.				38%
Week 11 20/3 – 24/3 (3 days)	Trigonometry	3. Solve problems in two and three dimensions applying the sine, cosine and area rules.				42%
END OF TERM 1 SCHOOLS CLOSES ON 24/03/2023						

DATE	TOPIC	CONTENT	F	ASSESSMENT	Date Completed	% Completed
TERM 2		2 TASKS FOR TERM 2				
Week 1 12/4 – 14/4 (3 days)	Euclidean Geometry	1. Revise earlier work on the necessary and sufficient conditions for polygons to be similar.				46%
Week 2 17/4 – 21/4	Euclidean Geometry	2. Prove (accepting results established in earlier grades): <ul style="list-style-type: none"> • that a line drawn parallel to one side of a triangle divides the other two sides proportionally (and the Mid-point Theorem as a special case of the converse of this theorem); • that equiangular triangles are similar; • that triangles with sides in proportion are similar; and the Pythagorean Theorem by similar triangles 				50%
Week 3 24/4 – 28/4 (3 days)	Analytical Geometry	1. Revise the following including grade 10 concepts: <ul style="list-style-type: none"> • the equation of a line through two given points; • the equation of a line through one point and parallel or perpendicular to a given line; and • The inclination (θ) of a line, where $m = \tan \theta$ is the gradient of the line ($0^\circ \leq \theta \leq 180^\circ$) 				54%
Week 4 01/5 – 05/5 (4 days)	Analytical Geometry	2. Apply the equation $(x - a)^2 + (y - b)^2 = r^2$ that defines a circle with radius r and centre $(a ; b)$. 3. Determine the equation of a tangent to a given circle.	F	ASSIGNMENT		58%
Week 5 08/5 – 12/5	Differential Calculus Including Polynomials	1. Factorise third-degree polynomials. Apply the Remainder and Factor Theorems to polynomials of degree at most 3 (no proofs required). 2. An intuitive understanding of the limit concept, in the context of approximating the rate of change or gradient of a function at a point.				62%
Week 6 15/5 – 19/5	Differential Calculus Including Polynomials	3. Use limits to define the derivative of a function f at any x : $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ Generalise to find the derivative of f at any point x in the domain of f , i.e., define the derivative function $f'(x)$ of the				65%

		<p>function $f(x)$. Understand intuitively that $f'(a)$ is the gradient of the tangent to the graph of f at the point with x-coordinate a.</p> <p>4. Using the definition (first principle), determine the derivative, $f'(x)$ where a, b and c are constants:</p> <p>4.1 $f(x) = ax^2 + bx + c$;</p> <p>4.2 $f(x) = ax^3$;</p> <p>4.3 $f(x) = \frac{a}{x}$ and</p> <p>4.4 $f(x) = c$.</p>			
<p>Week 7 22/5 – 26/5</p>	<p>Differential Calculus Including Polynomials)</p>	<p>5 Use the formula, $\frac{d}{dx}(ax^n) = anx^{n-1}$ (for any real number n) together with the rules</p> <p>5.1 $\frac{d}{dx}[f(x) \pm g(x)] = \frac{d}{dx}[f(x)] \pm \frac{d}{dx}[g(x)]$ and</p> <p>5.2 $\frac{d}{dx}[kf(x)] = k \frac{d}{dx}[f(x)]$, ($k$ a constant)</p>			<p>69%</p>
<p>Week 8 29/5 – 02/06</p>	<p>Differential Calculus Including Polynomials</p>	<p>6. Determine equations of tangents to graphs of functions.</p> <p>7. Introduce the second derivative $f''(x) = \frac{d}{dx}(f'(x))$ of $f(x)$ and how it determines the concavity of a function.</p> <p>8. Sketch graphs of cubic polynomial functions using differentiation to determine the coordinates of stationary points, and points of inflection (where concavity changes). Also, determine the x-intercepts of the graph using the factor theorem and other techniques.</p> <p>9. Solve practical problems concerning optimisation and rate of change, including calculus of motion.</p>			<p>73%</p>
<p>Week 09 05/6 – 09/6</p>	<p>June Examination/Control Test</p>			<p>JUNE EXAMINATION /CONTROL TEST</p>	

2023 Mathematics

ATP Grade 12

<p>Week 10 12/6 – 16/6 (4 days)</p>	<p>June Examination/Control Test</p>		<p>F</p>			
<p>Week 11 19/6 – 23/6</p>	<p>June Examination/Control Test</p>					
<p>END OF TERM 2 SCHOOLS CLOSES ON 23/06/2023</p>						

DATE	TOPIC	CONTENT	F	ASSESSMRNT	Date Completed	% Completed
TERM 3			2 TASKS FOR TERM 3			
Week 1 18/7 –21/7 (4days)	Finance, growth, decay and Annuities	1. Revise and use simple and compound growth and decay formulae: $A = P(1 \pm in)$ and $A = P(1 \pm i)^n$ to solve problems (including straight line, depreciation and depreciation on a reducing balance).				77%
Week 2 24/7 – 28/7	Finance, growth, decay and Annuities	2. Solve problems involving present value and future value annuities.				81%
Week 3 31/7 –04/8	Finance, growth, decay and Annuities	3. Make use of logarithms to calculate the value of n , the time period, in the equations $A = P(1 + i)^n$ or $A = P(1 - i)^n$. 4. Critically analyse investment and loan options and make informed decisions as to best option(s) (including pyramid)				85%
Week 4 07/8 – 11/8 (4 days)	Statistics	Revise: <ul style="list-style-type: none"> • Histograms • Frequency polygons • Ogives (cumulative frequency curves) • Variance and standard deviation of ungrouped data • Symmetric and skewed data • Identification of outliers. 	F	TEST		88%
Week 5 14/8 - 18/8	Statistics	Use statistical summaries, scatterplots, regression (in particular the least squares regression line) and correlation to analyse and make meaningful comments on the context associated with given bivariate data, including interpolation, extrapolation and discussions on skewness.				92%
Week 6 21/8 – 25/8	Probability and Counting principle	1. Revise, <ul style="list-style-type: none"> • the identity: $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ • the addition rule for mutually exclusive events: $P(A \text{ or } B) = P(A) + P(B)$ • the complementary rule: $P(\text{not } A) = 1 - P(A)$ • identifying dependent and independent events and, • the product rule for independent events: 				96%

		$P(A \text{ and } B) = P(A) \times P(B)$ <ul style="list-style-type: none"> the use of Venn diagrams to solve probability problems, deriving and applying formulae for any three events A, B and C in a sample space S. the use of tree diagrams for the probability of consecutive or simultaneous events which are not necessarily independent. 				
Week 7 28/8 – 01/9	Probability and Counting principle	2. Apply the fundamental counting principle to solve probability problems Probability problems using Venn diagrams, tree diagrams, two-way contingency tables and other techniques (like the Fundamental Counting Principle) to solve probability problems (where events are not necessarily independent).				100%
Week 8 04/9 – 08/9	Revision					
Week 9 11/9 – 15/9	Trial Examination		F	TRIAL EXAMINATION		
Week 10 18/9 – 22/9	Trial Examination					
Week 11 25/9 – 29/9 (4 days)	Trial Examination					
END OF TERM 3 SCHOOLS CLOSES ON 29/09/2023						

DATE	TOPIC	CONTENT	F	ASSESSMRNT	Date Completed	% Completed
TERM 4			1 TASK FOR TERM 4			
Week 1 10/10 – 13/10 (4 days)	Revision					
Week 2 16/10 – 20/10	Revision					
Week 3 23/10 – 27/10	Revision					
Week 4 30/10 – 03/11	Revision					
Week 5 06/11 – 10/11	FINAL EXAMINATIONS					
Week 6 13/11 – 17/11	FINAL EXAMINATIONS					
Week 7 20/11 – 24/11	FINAL EXAMINATIONS					
Week 8 27/11 – 01/12	FINAL EXAMINATIONS					
Week 9 04/12 – 08/12	FINAL EXAMINATIONS					
Week 10 11/12 – 13/12 (3 Days)	REPORTING					
END OF TERM 4 SCHOOLS CLOSES 13/ 12 / 2023 : END OF YEAR						