

SUGGESTED PLANNING OF TEACHING and ASSESSMENT

Grade 12 Mathematics 2022

TERM 1 47 days % completed	Week 1 (3) W:3,0%	Week 2: W: 6 %	Week 3: W: 9,1 %	Week 4 W: 15,1%	Week 5: W: 21,2%	Week 6: W: 27,3 %	Week 7: W:30,9%	Week 8: W:34,6%	Week 9: W: 38,2 %	Week 10: (4) W: 41,9 %		
CAPS Topic	NUMBER PATTERNS, SEQUENCES AND SERIES		CAPS pg. 10, 12 & 40		EUCLIDEAN GEOMETRY		CAPS pg. 10, 14 & 48		TRIGONOMETRY		CAPS pg. 10, 15, 42 & 44	
Topic, concepts, skills and values	Arithmetic Sequence Arithmetic Series Sigma Notation $T_n = a + (n - 1)d$ $d = T_n - T_{n-1}$ $S_n = \frac{n}{2}[2a + (n - 1)d]$ \sum	Geometric Sequence Geometric Series Sum to Infinity $T_n = ar^{n-1}$ $r = \frac{T_n}{T_{n-1}}$ $S_n = \frac{a(r^n - 1)}{r - 1}$ or $S_n = \frac{a(1 - r^n)}{1 - r}$; $r \neq 1$ $S_\infty = \frac{a}{1 - r}$; $-1 < r < 1$, $r \neq 1$	Sigma Notation Consolidation of Section \sum	Prove (accepting results established in earlier grades): • 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 this theorem);	Revise earlier work on the necessary and sufficient conditions for polygons to be similar. Prove: • that equiangular triangles are similar; • that triangles with sides in proportion are similar;	Mixed Application	Compound Angle and Double Angle identities and its derivation (bookwork)	Identities Involving Compound and Double Angles	Trig Equations (general/specific solutions) involving • Double, Compound Angles • Co-functions	Trig Graphs/Solutions of Triangles in 3D involving • Double, Compound Angles • Co-functions	$\cos(A - B) = \cos A \cdot \cos B + \sin A \cdot \sin B$ $\cos(A + B) = \cos A \cdot \cos B - \sin A \cdot \sin B$ $\sin(A - B) = \sin A \cdot \cos B - \sin B \cdot \cos A$ $\sin(A + B) = \sin A \cdot \cos B + \sin B \cdot \cos A$ $\cos 2A = \cos^2 A - \sin^2 A$ $\cos 2A = 2 \cos^2 A - 1$ $\cos 2A = 1 - \sin^2 A$ $\sin 2A = 2 \sin A \cdot \cos A$	
Date Completed												
Requisite pre-knowledge	Number Patterns, BODMAS, Substitution, Simplification, Equations	Exponents, BODMAS, Substitution, Simplification,	Exponents, BODMAS, Substitution, Simplification, Inequalities	Revise Ratio, Proportion and Area Triangles	Congruency & Similarity from grade 9	Revise Circle Geometry Theorems	Co-functions, Trig function of (-θ), ASTC rule	Gr 11 Identities, co-functions, trig function of (-θ), ASTC rule	Solving Trigonometric Equations	Grade 11 Trigonometric Graphs and area/ sine/cosine rules		
Siyavula												
Resources to enhance learning	https://schools.sun.ac.za/ ; https://www.mathpapa.com/algebra-calculator.html ; https://www.tutonic.org ; https://vodacom.mytopdog.co.za/users/register ; https://www.khanacademy.org/ ; Heymaths App from Playstore; Calculator App from Playstore; https://www.geogebra.org/?lang=en ; https://www.padowan.dk/download/ ; https://www.desmos.com/ ; https://nrich.maths.org/ ; National Exemplars; National Examination Papers (http://bit.ly/Gr12_Maths_Papers); http://wcedportal.co.za/ ; https://papervideo.co.za/free-resources ; https://www.siyavula.com/ ;											
Informal assessment;	Google form; Cumulative Assignment; Class Activity; Short class test; Class Discussions; Presentation of solutions; Vodacom revision exercises; Khan Academy Revision; Weekly Geometry questions are recommended;											
SBA (Formal Assessment)	Assignment:				Investigation here or term 2				Term 1 Control Test			

TERM 2 53 days % completed	Week 1 (4) W:48,4%	Week 2 (4) W: 56,4%	Week 3 (4) W: 62,8 %	Week 4 (4) W: 69,1%	Week 5 (4) W: 72,5 %	Week 6 W: 75,1%	Week 7 W: 78,5 %	Week 8 W:81%	Week 9 W: 83,0 %	Week 10 W: 84,2%	Week 11(3) & 12	
CAPS section	ANALYTICAL GEOMETRY CAPS pg. 10, 15 & 47		FUNCTIONS CAPS pg. 10, 12, 40 & 41		DIFFERENTIAL CALCULUS INCLUDING POLYNOMIALS CAPS pg. 10, 14 & 45			FINANCE, GROWTH AND DECAY CAPS pg 10, 12, 41 & 42		Revision & Consolidation		
Topic, concepts, skills and values	Derive and apply: 1. The equation that defines a circle with radius r and centre $(a;b)$. Equation: $(x - a)^2 + (y - b)^2 = r^2$	2. Determination of the equation of a tangent to a given circle.	1. Definition of Function (including restricted domain) 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: $y = ax + q$, $y = ax^2$ & $y = b^x$	Understand the Definition of logarithm. $y = \log_b x \iff x = b^y$; $b > 0$ and $b \neq 1$ Understand Inverse of exponential is a logarithmic functions. Determine and sketch graph and the inverse of the function defined by: $y = b^x$ for $0 < b < 1$ and $b > 1$.	Factorise third-degree polynomials. Apply factor and remainder theorem to polynomials of degree at most 3. 1. An intuitive understanding of the limit concept, in the context of approximating the rate of change or gradient of a function at a point. Use limits to define the derivative of a function f at any x : $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ 2. 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 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 .	3. Using the definition (first principle), find the derivative, $f'(x)$ where a , b and c constants: a) $f(x) = ax^2 + bx + c$ b) $f(x) = ax^3$ c) $f(x) = \frac{a}{x}$ d) $f(x) = c$ 4. Use the formula (for any real number n) together with the rules a) $\frac{d}{dx}[f(x) \pm g(x)] = \frac{d}{dx}[f(x)] \pm \frac{d}{dx}[g(x)]$ b) $\frac{d}{dx}[kf(x)] = k \frac{d}{dx}[f(x)]$, (k a constant) 5. Find equations of tangents to graphs of functions.	6. Introduce the second derivative of $f(x)$ and how it determines the concavity of a function. 7. 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.	Cubic Graphs 8. Solve practical problems concerning optimisation and rate of change, including calculus of motion.	1. Use simple and compound decay formulae: $A = (1 - in)$ and $A = (1 - i)^n$ to solve problems (including straight line depreciation and depreciation on a reducing balance). 2. The effect of different periods of compound growth and decay, including nominal and effective interest rates.	1. Calculating the time period of a loan or investment. Future Value Annuities	Revise Trigonometry Revise Calculus	
Date Completed												
Requisite pre-knowledge	1. Pythagoras, Distance, gradient, midpoint, inclination formula. If lines \perp , then product of their gradient is -1 2. the equation of a line through two given points; 3. the equation of a line through one point and parallel or perpendicular to a given line; and 4. The inclination (θ) of a line, where $m = \tan\theta$ is the gradient of the line ($0^\circ \leq \theta \leq 180^\circ$)	1. Tangent theorems 2. If lines \perp , then product of their gradient is -1 the equation of a line through two given points; 3. the equation of a line through one point and parallel or perpendicular to a given line; and 4. The inclination (θ) of a line, where $m = \tan\theta$ is the gradient of the line ($0^\circ \leq \theta \leq 180^\circ$)	Concept of a function How to sketch a straight line. How to sketch a parabola. 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.	Revise Exponential laws and exponential functions	Factorization of a quadratic. Long Division	Functional Notation Tangents, Equation of Line	Knowledge of how to sketch the grade 11 function.	Perimeter, Area and Volume Formulae of various objects. Problem Solving	Percentage Simple and compound growth formulae	Geometric Series Simple and Compound growth and decay, Logs		
Siyavula												
Resources to enhance learning	https://schools.sun.ac.za/ ; https://www.mathpapa.com/algebra-calculator.html ; https://www.tutonic.org ; https://vodacom.mytopdog.co.za/users/register ; https://www.khanacademy.org/ ; Heymaths App from Playstore; Calculator App from Playstore; https://www.geogebra.org/?lang=en ; https://www.padowan.dk/download/ ; https://www.desmos.com/ ; https://nrich.maths.org/ ; National Exemplars; National Examination Papers (http://bit.ly/Gr12_Maths_Papers); http://wcedportal.co.za/ ; https://papervideo.co.za/free-resources ; https://www.siyavula.com/ ;											
Informal assessment;	Google form; Cumulative Assignment; Class Activity; Short class test; Class Discussions; Presentation of solutions; Vodacom revision exercises; Khan Academy Revision											
SBA (Formal Assessment)	Investigation here or in term 1				Control Test							

TERM 3 52 days % completed	Week 1 (4) W: 87,3%	Week 2 W: 89,9%	Week 3 W: 90,9%	Week 4 (3) W:94,6%	Week 5 W: 97,3 %	Week 6 W:100%	Week 7 & 8	Week 9	Week 10	Week 11
CAPS section	FINANCE, GROWTH AND DECAY	STATISTICS CAPS pg. 10, 13 & 48			COUNTING AND PROBABILITY CAPS pg. 10, 14 & 49			Internal Examinations		
Topic, concepts, skills and values	2. Solve problems involving present value and future value annuities. 3. Make use of logarithms to calculate the value of n , the time period, in the equations $A = P(1 + i)^n$ or $A = P(1 - i)^n$	1.Histograms 2.Frequency polygons 3.Ogives (cumulative frequency curves) 4.Variance and standard deviation of ungrouped data 5.Symmetric and skewed data 6.Identification of outliers. 7. Revise symmetric and skewed data.	8. 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.	8. 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 Revise gr 10 – 12 Statistics	1.Revise the addition rule for mutually exclusive events: $P(A \text{ or } B) = P(A) + P(B)$ The complementary rule: $P(\text{not } A) = 1 - P(A)$ and the identity $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ 2.Identify dependents and independents events and the product rule for independent events: $P(A \text{ and } B) = P(A) \times P(B)$ 3. 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. 4. Use tree diagrams for the probability of consecutive or simultaneous events which are not necessarily independent. 5.Probability problems using Venn diagrams, tree diagrams, two-way contingency tables and other techniques to solve probability problems (where events are not necessarily independent).	6.Apply the fundamental counting principle to solve probability problems.	Revision	Format of the trial examination paper and weighting of topics will be as for the end of the year examination papers.		
Date Completed										
Requisite pre-knowledge	Geometric Series Simple and Compound growth and decay	Mean, Mode, Median, range, Box and whisker plots	Mean, Mode, Median, range, Box and whisker plots	Five number summary, Box and whisker plot, Ogive	How to calculate probability. Tree Diagrams 1.Revise the addition rule for mutually exclusive events: $P(A \text{ or } B) = P(A) + P(B)$ The complementary rule: $P(\text{not } A) = 1 - P(A)$ and the identity $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$	Grade 10 – 12 Probability				
Siyavula										
Resources to enhance learning	https://schools.sun.ac.za/ ; https://www.mathpapa.com/algebra-calculator.html ; https://www.tutonic.org ; https://vodacom.mytopdog.co.za/users/register ; https://www.khanacademy.org/ ; Heymaths App from Playstore ; Calculator App from Playstore; https://www.geogebra.org/?lang=en ; https://www.padowan.dk/download/ ; https://www.desmos.com/ ; https://nrich.maths.org/ ; National Exemplars ; National Examination Papers (http://bit.ly/Gr12_Maths_Papers) ; http://weedeportal.co.za/ ; https://papervideo.co.za/free-resources ; https://www.siyavula.com/									
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SBA (Formal Assessment)	Control Test									

TERM 4 47 days	Week 1 (4)	Week 2	Week 3	Week 4	Week 5	Week 6	External Examinations				
CAPS section	W: %	W: %	W: %	W: %	W: %		Notes on or guidelines for final examinations:				
Topic, concepts, skills and values	Revise Paper 1 Work	Revise Paper 2 Work	Examination Techniques Questions requested				Paper 1 : 3 hours		Paper 2: 3 hours		
Requisite pre-knowledge							Algebraic expressions and equations (and inequalities)	25	Euclidean Geometry and measurement	40	
Resources to enhance learning							Number patterns	25	Analytical Geometry	40	
Informal assessment;							Functions and graphs	35	Trigonometry	50	
SBA (Formal Assessment)							Finance, growth and decay	15	Statistics	20	
							Differential Calculus	35			
							Counting and probability	15			
							TOTAL MARK	150	TOTAL MARK	150	
SBA Weighting	TOTAL NUMBER OF SBA TASKS 6										
	Term 1 Assignment (15%), Investigation / Project (15%) and Test (15%)										
	Term 2 Test (15%)										
	Term 3 Test (15%) and Trial (25%)										
	Term 4 Final Examination										