KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GRADE 12 MATHEMATICS
2024 ANNUAL TEACHING PLAN

NAME OF SCHOOL: ……..……..……..……

NAME OF TEACHER: ……..……..…

TERM 1									
NUMBER OF DAYS	**DATE STARTED**	**DATE COMPLETED**	**TOPIC**	**CURRICULUM STATEMENT**	**ASSESSMENT**	**F/IF**	**DH SIGNATURE and DATE**	**% COM-PLETED**	
								Term	**Year**
17 – 26/01 (08 days)			**PATTERNS, SEQUENCES AND SERIES**	1. Number patterns, including arithmetic and geometric sequences and series.				19	7
29/01 – 07/02 (08 days)			**PATTERNS, SEQUENCES AND SERIES**	2. Sigma notation. 3. Derivation and application of the formulae for the sum of arithmetic and geometric series: 3.1 $S_n = \frac{n}{2}\left[2a+(n-1)d\right] = \frac{n}{2}(a+l)$; 3.2 $S_n = \frac{a(r^n-1)}{r-1}$ for $r \neq 1$; and 3.3 $S_\infty = \frac{a}{1-r}$ for $-1 < r < 1$.				40	16
08 – 12/02 (3 days)			**FUNCTIONS, INVERSES AND LOGARITHMS**	1. Definition of a function. 2. General concept of the inverse of a function. 3. Determine and sketch graphs of the inverse of the function defined by $y = ax + q$. 4. Focus on the following characteristics: domain and range, intercepts with the axes, shape and symmetry, gradient, whether the function increases/ decreases.	**INVESTIGATION SBA Weighting: 15%**			48	18
13 – 16/02 (4 days)			**FUNCTIONS, INVERSES AND LOGARITHMS**	5. Determine and sketch graphs of the inverse of the function defined by $y = ax^2$. 6. Determine 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. 7. Focus on the following characteristics: domain and range, intercepts with the axes, turning points, minima, maxima, shape and symmetry, average gradient (average rate of change), intervals on which the function increases/decreases.				57	22

TERM 1 (continued)

NUMBER OF DAYS	DATE STARTED	DATE COMPLETED	TOPIC	CURRICULUM STATEMENT	ASSESSMENT	F/IF	DH SIGNATURE and DATE	% COM-PLETED	
								Term	Year
19/02 – 22/02 (4 days)			**FUNCTIONS, INVERSES AND LOGARITHMS**	8. Determine and sketch graphs of the inverse of the function defined by $y = b^x$ for $b > 0$, $b \neq 1$. 9. Focus on the following characteristics: domain and range, intercepts with the axes, asymptotes (horizontal and vertical), shape and symmetry, average gradient (average rate of change), intervals on which the function increases/decreases. 10. Understand the definition of a logarithm: $y = \log_b x \Leftrightarrow x = b^y$, where $b > 0$ and $b \neq 1$. 11. The graph of the function defined by $y = \log_b x$ for both the cases $0 < b < 1$ and $b > 1$.				67	26
23 – 26/02 (2 days)			**FUNCTIONS, INVERSES AND LOGARITHMS**	12. Further sketching and interpretation of graphs of functions and their inverses.				71	28
27/02 – 08/03 (9 days)			**TRIGONO-METRY: COMPOUND ANGLES**	**Revise Grade 11 Work** Compound angle identities: 1. $\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$ 2. $\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$ 3. $\sin 2\alpha = 2\sin\alpha\cos\alpha$ 4. $\cos 2\alpha = \cos^2\alpha - \sin^2\alpha$ 5. $\cos 2\alpha = 2\cos^2\alpha - 1$ 6. $\cos 2\alpha = 1 - 2\sin^2\alpha$		**F**		90	35
11 – 14/03 (04 days)			**TRIGONO-METRY: 2D/3D**	**Revise Sine, Cosine and Area Rules** Solve problems in two and three dimensions.				100	39
15 – 20/03 (04 days)			**REVISION AND MARCH TEST**	**MARCH TEST to cover all the work done in Term 1 excluding 2D/3D problems. The Grade 11work done on all these topics will also be included.**	**MARCH TEST SBA Weighting: 15%**	**F**			

TERM 2									
NUMBER OF DAYS	**DATE STARTED**	**DATE COMPLETED**	**TOPIC**	**CURRICULUM STATEMENT**	**ASSESSMENT**	**F/IF**	**DH SIGNATURE and DATE**	**% COM-PLETED**	
								Term	**Year**
03 – 10/04 (6 days)			**EUCLIDEAN GEOMETRY**	1. Revise earlier work on the necessary and sufficient conditions for polygons to be similar. 2. 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 Midpoint Theorem as a special case of this theorem). 3. Solve proportionality problems and prove riders.	**ASSIGNMENT SBA Weighting: 15%**	**F**		16	44
11 – 18/04 (6 days)			**EUCLIDEAN GEOMETRY**	4. Prove (accepting results established in earlier grades): 4.1 that equiangular triangles are similar; 4.2 that triangles with sides in proportion are similar; and 4.3 the Pythagorean Theorem by similar triangles. 5 Solve similarity problems and prove riders.				32	50
19 – 22/04 (2 days)			**CALCULUS**	1. An intuitive understanding of the limit concept. 2. Use limits to define the derivative of a function f at any x: $f'(x)=\lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$. 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 function $f(x)$. Understand intuitively that $f'(a)$ is the gradient of the tangent to the graph of f at the point with x-co-ordinate a.				38	51
23 – 25/04 (3 days)			**CALCULUS**	3. Using the definition (first principles), find the derivative, $f'(x)$, for 3.1 $f(x)=ax^2+bx+c$ 3.2 $f(x)=ax^3$ 3.3 $f(x)=\frac{a}{x}$ 3.4 $f(x)=c$ (a, b and c are constants).				46	54

TERM 2 (continued)									
NUMBER OF DAYS	**DATE STARTED**	**DATE COMPLETED**	**TOPIC**	**CURRICULUM STATEMENT**	**ASSESSMENT**	**F/IF**	**DH SIGNATURE and DATE**	**% COM-PLETED**	
								Term	**Year**
26 – 30/04 (3 days)			**CALCULUS**	4. Use the formula $\frac{d}{dx}\left(ax^n\right) = anx^{n-1}$, for any real number n, together with the rules: 4.1 $\frac{d}{dx}\left[f(x) \pm g(x)\right] = \frac{d}{dx}\left[f(x)\right] \pm \frac{d}{dx}\left[g(x)\right]$; and 4.2 $\frac{d}{dx}\left[kf(x)\right] = k\frac{d}{dx}\left[f(x)\right]$ (k a constant).				54	57
02 – 03/05 (2 days)			**CALCULUS**	5. Find equations of tangents to graphs of functions.				59	59
06 – 07/05 (2 days)			**CALCULUS**	6. Apply the Remainder and Factor Theorems to polynomials of degree at most 3. 7. Factorise third degree polynomials.				65	61
08 – 10/05 (3 day)			**CALCULUS**	8. Introduce the second derivative $f''(x) = \frac{d}{dx}f'(x)$ of $f(x)$, and how it determines the concavity of a function. 9. Sketch graphs of 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.				73	63
13 – 14/05 (2 day)			**CALCULUS**	10. Solve practical problems concerning optimisation and rate of change, including calculus of motion.				78	65
15 – 16/05 (2 days)			**ANALYTICAL GEOMETRY**	1. Revise the following including grade 10 concepts: 1.1. The Equation of a line through two given points. 1.2. The equation a line through one point and parallel or perpendicular to a given line. 2. The inclination (θ) of a line, where $m = \tan\theta$ is the gradient of the line $(0° \le \theta \le 180°)$				84	67
17 – 22/05 (4 days)			**ANALYTICAL GEOMETRY**	2. The equation $(x-a)^2 + (y-b)^2 = r^2$ defines a circle with radius r and centre $(a;b)$ **NOTE: Include circles that touch internally and externally**				95	71

TERM 2 (continued)									
NUMBER OF DAYS	**DATE STARTED**	**DATE COMPLETED**	**TOPIC**	**CURRICULUM STATEMENT**	**ASSESSMENT**	**F/IF**	**DH SIGNATURE and DATE**	**% COM-PLETED**	
								Term	**Year**
23 – 24/05 (2 days)			**ANALYTICAL GEOMETRY**	Determination of the equation of a tangent to a given circle.				100	72
27/05 – 14/06 (15 days)			**REVISION AND JUNE EXAMINATION**	**JUNE EXAMINATION**	**JUNE EXAMINATION SBA WEIGHTING: 15%**	**F**			

TERM 3									
NUMBER OF DAYS	**DATE STARTED**	**DATE COMPLETED**	**TOPIC**	**CURRICULUM STATEMENT**	**ASSESSMENT**	**F/IF**	**DH SIGNATURE and DATE**	**% COM-PLETED**	
								Term	**Year**
09 – 10/07 (2 days)			**FINANCE, GROWTH AND DECAY: (FROM GR. 11)**	Revise: 1. Use simple and compound decay formulae, $A = P(1-i.n)$ and $A = P(1-i)^n$, to solve problems (including straight line depreciation and depreciation on a reducing balance). 2. Different periods of compound growth and decay. 3. Effective and nominal interest rates.				7	74
11 – 12/07 (2 days)			**FINANCE, GROWTH AND DECAY**	4. Make use of logarithms to calculate the value of n, the time period, in the equations: $A = P(1+i)^n$ *or* $A = P(1-i)^n$				13	76
15 – 23/07 (7 days)			**FINANCE, GROWTH AND DECAY**	5. Solve problems involving present value and future value annuities. 6. Critically analyse investment and loan options and make informed decisions as to best option(s), including pyramid schemes.				37	83
24/07 –26/07 (3 days)			**STATISTICS: (FROM GR. 11)**	Revise: 1. Histograms and frequency polygons. 2. Variance and standard deviation of ungrouped data 3. Ogives (cumulative frequency curves). 4. Symmetric and skewed data. 5. Identification of outliers.				47	85
29 – 02/08 (5 days)			**STATISTICS: REGRESSION AND CORRELATION**	6. 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.				63	90
05 – 07/08 (3 days)			**PROBABILITY (FROM GR. 11)**	1. Revise: 1.1. the addition rules for mutually exclusive events: $P(A \text{ or } B) = P(A) + P(B)$; 1.2. the complementary rule $P(\text{not } A) = 1 - P(A)$; 1.3. and the identity $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$. 2. Identify dependent and independent events and the Product rule for independent events: $P(A \text{ and } B) = P(A) \times P(B)$.				73	93

TERM 3 (continued)									
NUMBER OF DAYS	**DATE STARTED**	**DATE COMPLETED**	**TOPIC**	**CURRICULUM STATEMENT**	**ASSESSMENT**	**F/IF**	**DH SIGNATURE and DATE**	**% COM-PLETED**	
								Term	**Year**
			PROBABILITY (FROM GR. 11)	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. Use contingency tables to solve probability problems.					
08 – 20/08 (8 days)			**COUNTING AND PROBABILITY**	5. Apply the fundamental counting principle to solve probability problems.	**TERM 3 TEST SBA Weighting: 15%**	**F**		100	100
21/08 – 20/09 (23 days)			**REVISION AND TRIAL EXAMINATION**	**TRIAL EXAMINATION to cover all the TOPICS dealt with in both Grades 11 and 12.**	**TRIAL EXAM SBA Weighting: 25%**	**F**			