GAUTENG   PROVINCE
MATHEMATICS – ANNUAL TEACHING PLAN –GRADE 11
FINAL GRADE 11 ATP 2022: 12 JANUARY 2022

DATE	TOPIC	CONTENT	F	ASSESSMENT	Date Completed	% Completed
TERM 1			**2 TASKS FOR TERM 1**			
Week 1 **12/1 – 14/1** **(3 days)**	Exponents and Surds	1. Simplify expressions and solve equations using the laws of exponents for rational exponents where $x^{\frac{p}{q}} = \sqrt[q]{x^p};\ x > 0\ ;q > 0$ 2. Add, subtract, multiply and divide simple surds. 3. Solve simple equations involving surds.				**3%**
Week 2 **17/1 – 21/1**	Equations	1. Complete the square 2. Solve Quadratic equations (by factorization and by using the quadratic formula) ; K- Method				**6%**
Week 3 **24/1 – 28/1**	Equations and Inequalities	3. Solve Quadratic inequalities in one unknown (Interpret solutions graphically.) **NB**:It is recommended that the solving of equations in two unknowns is important to be used in other equations like hyperbola-straight line as this is normal in the case of graphs				**8%**
Week 4 **31/1 – 04/2**	Equations and Inequalities	4. Equations in two unknowns, one of which is linear and the other quadratic 5. Nature of roots				**11%**
Week 5 **07/2 – 11/2**	Euclidian Geometry	Teach past grades concepts required for smooth content progression into Gr 11 such as: Angles, lines, triangles, etc.		**PROJECT/ INVESTIGATION** SBA marks: **15%**		**14%**
Week 6 **14/2 –18/2**	Euclidian Geometry	Accept results established in earlier grades as axioms and also that a tangent to a circle is perpendicular to the radius, drawn to the point of contact. Then investigate and prove the theorems of the geometry of circles: **CENTRE THEOREMS** • The line drawn from the centre of a circle perpendicular to a chord bisects the chord; • The line drawn from the centre of the chord to the midpoint of the chord is perpendicular to the chord. • An angle subtended by the arc at the centre of the circle is two times the angle subtended by the same arc at the circumference of the circle • An angle in the semi-circle is 90° • The perpendicular bisector of a chord passes through the centre of the circle. **Use the above theorems and their converses, where they exist, to solve riders.**	F			**17%**
Week 7 **21/2 – 25/2**	Euclidian Geometry	**CYCLIC QUAD THEOREMS** • Angles subtended by a chord of the circle, on the same side of the chord, are equal; • The opposite angles of a cyclic quadrilateral are supplementary; • An exterior angle of the cyclic quad is equal to the interior opposite angle • A radius and a tangent are perpendicular at the point of contact **Use the above theorems and their converses, where they exist, to solve riders.**				**19%**
Week 8 **28/2 – 04/3**	Euclidian Geometry	**TANGENTS THEOREMS** • Two tangents drawn to a circle from the same point outside the circle are equal in length;				**22%**

			F			
		• The angle between the tangent to a circle and the chord drawn from the point of contact is equal to the angle in the alternate segment. **Use the above theorems and their converses, where they exist, to solve riders.**				
Week 9 07/3 – 11/3	Trig functions and revision grade 10 trigonometry	1. Derive and use the identities:$\tan\theta = \frac{\sin\theta}{\cos\theta}$ $\theta \ne k.90°, k$ an odd integer; and $\sin^2\theta + \cos^2\theta = 1$. 2. Derive and use reduction formulae to simplify the following expressions: 2.1. sin $(90° \pm \theta)$; cos $(90° \pm \theta)$; 2.2. sin $(180° \pm \theta)$; cos $(180° \pm \theta)$ and tan $(180° \pm \theta)$; 2.3. sin $(360° \pm \theta)$; cos $(360° \pm \theta)$ and tan $(360° \pm \theta)$;	F	**TEST** **SBA marks: 14%**		**25%**
Week 10 14/3 – 17/3 **(4 days)**	Trig Identities & Reduction formulae	2.4. sin $(-\theta)$; cos $(-\theta)$ and tan $(-\theta)$; 3. Determine for which values of a variable an identity holds.				**28%**
END OF TERM 1 SCHOOLS CLOSES ON 17/03/2022						

DATE	TOPIC	CONTENT	F	ASSESSMENT	Date Completed	% Completed
TERM 2				**2 TASKS FOR TERM 2**		
Week 1 05/4 – 08/4 **(4 days)**	Trig equations and general solutions	4. Determine the general solutions of trigonometric equations. Also, determine solutions in specific intervals				**31%**
Week 2 11/4 –15/4 **(4 days)**	QUADRILATERALS	Teach past grade content on Quadrilaterals Parallelogram,square,rectangle etc.				**33%**
Week 3 18/4 – 22/4 **(4 days)**5	Analytical Geometry	Revise 1. distance between the two points; 2. gradient of the line segment connecting the two points (and from that identify parallel and perpendicular lines); and 3. Coordinates of the mid-point of the line segment joining the two points. Derive and apply: 1. the equation of a line through two given points;				**36%**
Week 4 25/4 – 29/4 **(4 days)**	Analytical Geometry	Derive and apply: 2.the equation of a line through one point and parallel or perpendicular to a given line; and 3.The inclination (θ) of a line, where $m = \tan\theta$ is the gradient of the line $(0° \le \theta \le 180°)$ Applications in complex diagrams.				**39%**
Week 5 02/5 – 06/5 **(4 days)**	Number patterns	• Revise linear number patterns. • Investigate number patterns leading to those where there is a constant second difference between consecutive terms, and the general term is therefore quadratic.				**42%**
Week 6 09/5 – 13/5	Number patterns	• Investigate number patterns leading to those where there is a constant second difference between consecutive terms, and the general term is therefore quadratic.				**44%**
Week 7 16/5 – 20/5	Functions	1.Revise the effect of the parameters a and q and investigate the effect of p on the graphs of the functions defined by: 1.1. $y = f(x) = a(x + p)^2 + q$ 1.2. $y = f(x) = a(x + p) + q$	F	**ASSIGNMENT** **SBA marks: 15%**		**47%**
Week 8 23/5 – 27/5	Functions	1.3. $y = f(x) = \frac{a}{x+p} + q$ 1.4. $y = f(x) = a.b^{x+p} + q$ where $b > 0$, $b \ne 1$ 2. Investigate numerically the average gradient between two points on a curve and develop an				**50%**

		intuitive understanding of the concept of the gradient of a curve at a point. **NB: Apply nature of roots with Functions**				
Week 9 30/5 – 03/06	Functions	3. Point by point plotting of basic graphs defined by $y = sin\theta$, $y = cos\theta$ and $y = tan\theta$ for $\theta \in [-360°; 360°]$ 4.Investigate the effect of the parameter *k* on the graphs of the functions defined by $y = \sin(kx)$, $y = \cos(kx)$ and $y = tan(kx)$				52%
Week 10 06/6 – 10/6	Functions	5. Investigate the effect of the parameter *p* on the graphs of the functions defined by $\qquad y = \sin(x + p)$, $\qquad y = \cos(x + p)$ and $y = tan(x + p)$	F	**TEST** **SBA marks: 14%**		56%
Week 11 13/6 – 17/6 (3 days)	Functions	6. Draw sketch graphs defined by: $y = a \sin k(x + p)$, $y = a \cos k(x + p)$ and $y = a \tan k(x + p)$ at most two parameters at a time.				58%
Week 12 **20/6 – 24/6**	Trigonometry Sin/Cos/Area rules	1. Prove and apply the sine, cosine and area rules.				61%
END OF TERM 2 SCHOOLS CLOSES ON 24/06/2022						

DATE	TOPIC	CONTENT	F	ASSESSMRNT	Date Completed	% Completed
TERM 3				**2 TASKS FOR TERM 3**		
Week 1 19/7 –22/7 (4days)	Trigonometry Sin/Cos/Area rules	2. Solve problems in two dimensions using the sine, cosine and area rules.				**64%**
Week 2 25/7 – 29/7	Measurements	1.Revise the volume and surface areas of right-prisms and cylinders.				**67%**
Week 3 01/8 –05/8	Measurements	2.Study the effect on volume and surface areas when multiplying any dimension by a constant factor k. 3.Calculate volume and surface areas of spheres, right prisms, right cones and combination of those objects (figures).	F	**TEST SBA marks: 14%**		**69%**
Week 4 08/8 – 12/8 (3 days)	Statistics	1.Revise measures of central tendency in ungrouped data. 2. Measures of central tendency in grouped data: calculation of mean estimate of grouped and ungrouped data and identification of modal interval and interval in which the median lies. 3. Revision of range as a measure of dispersion and extension to include percentiles, quartiles, inter-quartile and semi-inter-quartile range.				72%
Week 5 15/8 - 19/8	Statistics	4. Five number summary (maximum, minimum and quartiles) and box and whisker diagram. 5. Use the statistical summaries (measures of central tendency and dispersion), and graphs to analyse and make meaningful comments on the context associated with the given data. 6.Histograms				**75%**
Week 6 22/8 – 26/8	Statistics	7.Frequency polygons 8.Ogives (cumulative frequency curves) 9.Variance and standard deviation of ungrouped data 10.Symmetric and skewed data 11. Identification of outliers.				**78%**
Week 7 29/8 – 02/9	Probability	1.The use of probability models to compare the relative frequency of events with the theoretical probability. 2.Teach the addition rule for mutually exclusive events: $P(A\ or\ B) = PA + P(B)$ A and B are Mutually exclusive $$P(A\ and\ B) = 0;$$ The complementary rule: $P(not\ A) = 1 - P(A)$ and the identity $P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B)$				**81%**
Week 8 05/9 – 09/9	Probability	3.The use of Venn diagrams to solve probability problems, deriving and applying the following for any two events in a sample space S:		**TEST SBA marks:**		**83%**
Week 9 12/9 – 16/9	Probability	4.Identify dependents and independents events and the product rule for independent events: $P(A\ and\ B) = P(A) \times P(B)$ 5.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.	F	**14%**		**86%**
Week 10 19/9 – 23/9	Probability	6.Use tree diagrams for the probability of consecutive or simultaneous events which are not necessarily independent 7.Contigency table, the use of contingency tables to solve probability problems for three events in a sample space				**89%**
Week 11 26/9 – 30/9	Financial Maths	Use the simple and compound growth formulae:$A = P(1 + in)$ and $A = P(1 + i)^n$ solve problems, including interest, hire purchase, inflation, population growth and other real-life problems.				**92%**
		END OF TERM 3 SCHOOLS CLOSES ON 30/09/2022				

DATE	TOPIC	CONTENT	F	ASSESSMRNT	Date Completed	% Completed
TERM 4				**1 TASK FOR TERM 4**		
Week 1 11/10 – 14/10 (4days)	Financial Maths	2. Understand the implication of fluctuating foreign exchange rates (e.g. on the petrol price, imports, exports, overseas travel).				**94%**
Week 2 17/10 – 21/10	Financial Maths	3.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).	F	**TEST** **SBA marks: 14%**		**97%**
Week 3 24/10 – 28/10	Financial Maths	4.The effect of different periods of compound growth and decay, including nominal and effective interest rates				**100%**
Week 4 31/10 – 04/11	**REVISION**	**REVISION**				
Week 5 07/11 – 11/11	**FINAL EXAMINATIONS**			**SBA: 25%** **Final exam:** **75 %**		
Week 6 14/11 – 18/11	**FINAL EXAMINATIONS**					
Week 7 21/11 – 25/11	**FINAL EXAMINATIONS**					
Week 8 28/11 – 02/12	**FINAL EXAMINATIONS**					
Week 9 05/12 – 09/12	**REPORTING**					
Week 10 12/12 – 16/12 (4 Days0	**REPORTING**					
END OF TERM 4 14/12 /2022 END OF YEAR						

Mark distribution for Mathematics NCS end-of-year papers: Grades 10-12			
Paper 1: Grades 12: bookwork: maximum 6 marks			
description	**Grade 10**	**Grade 11**	**Grade. 12**
Algebra and equations (and inequalities)	30 ± 3	45 ± 3	25 ± 3
Patterns and sequences	15 ± 3	25 ± 3	25 ± 3
Finance and growth	10 ± 3		
Finance, growth and decay		15 ± 3	15 ± 3
Functions and graphs	30 ± 3	45 ± 3	35 ± 3
Differential Calculus			35 ± 3
Probability	15 ± 3	20 ± 3	15 ± 3
Total	**100**	**150**	**150**
Paper 2: Grades 11 and 12: theorems and/or trigonometric proofs: maximum 12 marks			
description	**Grade 10**	**Grade 11**	**Grade 12**
Statistics	15 ± 3	20 ± 3	20 ± 3
Analytical Geometry	15 ± 3	30 ± 3	40 ± 3
Trigonometry	40 ± 3	50 ± 3	50 ± 3
Euclidean Geometry and Measurement	30 ± 3	50 ± 3	40 ± 3
Total	**100**	**150**	**150**

note:
- Modelling as a process should be included in all papers, thus contextual questions can be set on any topic.
- Questions will not necessarily be compartmentalised in sections, as this table indicates. Various topics can be integrated in the same question.

NB:

- # 7 SBA TASKS TO BE COMPLETED IN 2022

THE TASKS ARE AS FOLLOWS: SBA

TERM	SBA TASKS	WEIGNTING
1	Investigation/Project	15%
	Test	14%
2	Assignment	15%
	Test	14%
3	Test	14%
	Test	14%
4	Test	14%
	WEIGHTING	**100%**