2023/24 ANNUAL TEACHING PLANS: MATHEMATICS: GRADE 9 (TERM 1)

TERM 1	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
HOURS PER TOPIC	**8,5 hrs**		**9 hrs**		**2 hrs**	**9 hrs**		**9 hrs**		**4,5 (2,5) hrs**	**2,5 (4,5) hrs**
TOPICS, CONCEPTS AND SKILLS	**WHOLE NUMBERS** **Properties of numbers** • Describe the real number system by recognising, defining and distinguishing properties of: – Natural numbers, whole numbers, integers, rational numbers, irrational numbers **Multiples and factors** • Use prime factorisation of numbers to find LCM and HCF **Solving problems** • Solve problems in contexts involving: – Ratio and rate – Direct and indirect proportion • Solve problems that involve whole numbers, percentages and decimal fractions in financial contexts such as: – Commission – Rentals – Compound interest		**INTEGERS** **Calculations with integers** • Revise: – Addition and subtraction with integers – Multiplication and division with integers – Perform calculations involving all four operations with integers – Perform calculations involving all four operations with numbers that involve the squares, cubes, square roots and cube roots of integers **Properties of integers** • Revise: – Commutative, associative and distributive properties of addition and multiplication for integers – Additive and multiplicative inverses for integers		**FORMAL ASSESSMENT TASK** **ASSIGNMENT** • Whole numbers • Integers	**EXPONENTS** **Calculations using numbers in exponential form** • **Revise** the following general laws of exponents. – $a^m \times a^n = a^{m+n}$ – $a^m \div a^n = a^{m-n}$, if $m>n$ – $(a^m)^n = a^{m \times n}$ – $(a \times t)^n = a^n \times t^n$ – $a^0 = 1$ • **Extend** the general laws of exponents to include: – integer exponents – $a^{-m} = \frac{1}{a^m}$ • Perform calculations involving all four operations using numbers in exponential form		**NUMERIC AND GEOMETRIC PATTERNS** **Investigate and extend patterns** • Investigate and extend numeric and geometric patterns looking for relationships between numbers including patterns: – Represented in physical or diagram form, not limited to sequences involving a constant difference or ratio, of learner's own creation, represented in tables, represented algebraically • Describe and justify the general rules for observed relationships between numbers in own words or in algebraic language		**REVISION**	**FORMAL ASSESSMENT TASK** **TEST** All topics
PREREQUISITE SKILL OR PRE-KNOWLEDGE	• The commutative; associative; distributive properties of whole numbers • 0 in terms of its additive property (identity element for addition) • 1 in terms of its multiplicative property (identify element for multiplication) • Recognise the division property of 0, whereby any number divided by 0 is undefined		• Perform calculations involving all four operations with numbers that involve squares, cubes, square roots and cube roots of integers • Calculate the squares, cubes, square roots and cube roots of rational numbers			• Recognise and use the appropriate laws of numbers involving exponents and square and cube roots		• Determine input values, output values and rules for patterns given in input-output diagrams • Determine equivalence of different descriptions of the same relationship or rule presented verbally, in a flow diagram, by a number sentence			

2023/24 ANNUAL TEACHING PLANS: MATHEMATICS: GRADE 9 (TERM 2)

<table>
<tr><th>TERM 2</th><th rowspan="2">3 hrs</th><th>WEEK 1</th><th>WEEK 2</th><th>WEEK 3</th><th>WEEK 4</th><th>WEEK 5</th><th>WEEK 6</th><th>WEEK 7</th><th>WEEK 8</th><th>WEEK 9</th><th>WEEK 10</th><th>WEEK 11</th></tr>
<tr><th>HOURS PER TOPIC</th><th colspan="5">13,5 hrs</th><th colspan="2">9 hrs</th><th>4,5 hrs</th><th>4,5 hr</th><th colspan="2">8 hrs</th></tr>
<tr>
<td>TOPICS, CONCEPTS AND SKILLS</td>
<td>FORMAL ASSESSMENT TASK
INVESTIGATION
N.B. Administer an investigation on any ONE of the term 2 topics before teaching it.</td>
<td colspan="5">ALGEBRAIC EXPRESSIONS
Algebraic language
• Revise the following:
– Recognise and identify conventions for writing algebraic expressions
– Identify and classify like and unlike terms in algebraic expressions
– Recognise and identify coefficients and exponents in algebraic expressions
– Recognise and differentiate between monomials, binomials and trinomials
Expand and simplify algebraic expressions
• Revise the following: using the commutative, associative and distributive laws for rational numbers and laws of exponents to:
– Add and subtract like terms in algebraic expressions
– Multiply integers and monomials by: monomials, binomials, trinomials
– Divide the following by integers or monomials: monomials, binomials, trinomials
– Simplify algebraic expressions involving the above operations
– Determine the squares, cubes, square roots and cube roots of single algebraic terms or like algebraic terms
NB. ENSURE THAT COMMON FRACTIONS AND DECIMAL FRACTIONS ARE PART OF CALCULATIONS WITH EXPRESSIONS (Page 122 and 123 of CAPS)
• Extend the above algebraic manipulations to include:
– Multiply integers and monomials by polynomials
– Divide polynomials by integers or monomials
– The product of two binomials
– The square of a binomial
• Determine the numerical value of algebraic expressions by substitution
Factorise algebraic expressions
• Factorise algebraic expressions that involve:
– Common factors
– Difference of two squares
– Trinomials of the form:
✓ $x^2 + bx + c$
✓ $ax^2 + bx + c$, where a is a common factor
• Simplify algebraic expressions that involve the above factorisation processes
• Simplify algebraic fractions using factorisation</td>
<td colspan="2">ALGEBRAIC EQUATIONS
• Revise the following:
– Set up equations to describe problem situations
– Analyse and interpret equations that describe a given situation
– Solve equations by inspection
– Using additive and multiplicative inverses using laws of exponents
– Solve equations by substitution
– Use substitution in equations to generate tables of ordered pairs
• Extend solving equations to include:
– Using factorisation
– Equations of the form: a product of factors = 0</td>
<td>FUNCTIONS AND RELATIONSHIPS
Input and output values
• Determine input values, output values or rules for patterns and relationships using:
– Flow diagrams
– Tables
– Formulae
– Equations
Equivalent forms
• Determine, interpret and justify equivalence of different descriptions of the same relationship or rule presented:
– Verbally
– In flow diagrams
– In tables
– By formulae
– By equations
– By graphs on a Cartesian plane</td>
<td>REVISION</td>
<td colspan="2">FORMAL ASSESSMENT TASK
TEST
All term 1 & 2 topics</td>
</tr>
</table>

TERM 2	3 hrs	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
HOURS PER TOPIC		**13,5 hrs**					**9 hrs**		**4,5 hrs**	**4,5 hr**	**8 hrs**	
PREREQUISITE SKILL OR PRE-KNOWLEDGE		• Common and decimal fractions • Algebraic language • Factors and multiples • Expand and simply algebraic expressions • Substitution • Determine the squares, cubes, square roots and cube roots of single algebraic terms or like algebraic terms					• Write number sentences to describe problem situations • Analyse and interpret number sentences that describe a given situation • Solve and complete number sentences by: – Inspection – Trial and improvement • Identify variables and constants in given formulae or equations • Use substitution in equations to generate tables of ordered pairs • Extend solving equations to include: – Using additive and multiplicative inverses – Using laws of exponents					

2023/24 ANNUAL TEACHING PLANS: MATHEMATICS: GRADE 9 (TERM 3)

<table>
<tr><th>TERM 3</th><th rowspan="2"></th><th>WEEK 1</th><th>WEEK 2</th><th>WEEK 3</th><th>WEEK 4</th><th>WEEK 5</th><th>WEEK 6</th><th>WEEK 7</th><th>WEEK 8</th><th>WEEK 9</th><th>WEEK 10</th><th>WEEK 11</th></tr>
<tr><th>HOURS PER TOPIC</th><th colspan="3">9 hrs</th><th colspan="2">9 hrs</th><th colspan="4">15 hrs</th><th>4.5 hrs</th><th>4.hrs</th></tr>
<tr>
<td>TOPICS, CONCEPTS AND SKILLS</td>
<td>FORMAL ASSESSMENT TASK
PROJECT
The project should cover a combination of topics from term 1 to term 3 and must be completed before the end of term 3</td>
<td colspan="3">GRAPHS

Interpreting graphs
• Extend the focus on features of graphs with special focus on the following features of linear graphs:
– x-intercept and y-intercept
– Gradient

Drawing graphs
• Use tables of ordered pairs to plot points and draw graphs on the Cartesian plane
• Extend drawing of graphs with special focus on:
– Drawing linear graphs from given equations
– Determining equations from given linear graphs</td>
<td colspan="2">GEOMETRY OF STRAIGHT LINES

Angle relationships
• Revise and write clear descriptions of the relationship between angles formed by:
– Perpendicular lines
– Intersecting lines
– Parallel lines cut by a transversal

Solving problems
• Solve geometric problems using the relationships between pairs of angles described above</td>
<td colspan="4">GEOMETRY OF 2D SHAPES AND CONSTRUCTION OF GEOMETRIC FIGURES
Classifying 2D shapes
• Revise properties and definitions of triangles in terms of their sides and angles, distinguishing between:
– Equilateral triangles
– Isosceles triangles
– Right-angled triangles
Constructions
PROVIDE LEARNERS WITH ACCURATELY CONSTRUCTED FIGURES TO INVESTIGATE THE PROPERTIES OF TRIANGLES
• Investigate the angles in a triangle, focusing on the relationship between the exterior angle of a triangle and its interior angles
Classifying 2D shapes
• Revise and write clear definitions of quadrilaterals in terms of their sides, angles and diagonals, distinguishing between:
– Parallelogram
– Rectangle
– Square
– Rhombus
– Trapezium
– Kite
Constructions
PROVIDE LEARNERS WITH ACCURATELY CONSTRUCTED FIGURES TO INVESTIGATE THE PROPERTIES OF QUADRILATERALS
• Investigate sides and angles. and diagonals in quadrilaterals, focusing on:
– Exploring the sum of the interior angles of polygons
– The diagonals of rectangles, squares,
– Parallelograms, rhombi and kites
Similar and congruent triangles
• Through investigation, establish the minimum conditions for congruent triangles
• Through investigation, establish the minimum conditions for similar triangles
Constructions
PROVIDE LEARNERS WITH ACCURATELY CONSTRUCTED FIGURES
• Explore the minimum conditions for two triangles to be congruent
Solving problems
• Solve geometric problems involving unknown sides and angles in triangles and quadrilaterals, using known properties of triangles and quadrilaterals, as well as properties of congruent and similar triangles</td>
<td>REVISION</td>
<td>FORMAL ASSESSMENT TASK
TEST
All term 3 topics</td>
</tr>
</table>

TERM 3		WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
HOURS PER TOPIC		**9 hrs**			**9 hrs**		**15 hrs**				**4.5 hrs**	**4.hrs**
PREREQUISITE SKILL OR PRE-KNOWLEDGE					• Recognise and describe pairs of angles formed by: – Perpendicular lines – Intersecting lines – Parallel lines cut by a transversal • Solve geometric problems using the relationships between pairs of angles described above		• The sum of the interior angles of triangles • Identify and write clear definitions of types of triangles focusing on sides and angles					

2023/24 ANNUAL TEACHING PLANS: MATHEMATICS: GRADE 9 (TERM 4)

TERM 4	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
HOURS PER TOPIC	**7 hrs**		**9 hrs**		**9 hrs**		**4,5 hrs**	**12,5 hrs**		
TOPICS, CONCEPTS AND SKILLS	**TRANSFORMATION GEOMETRY** **Transformations** Recognise, describe and perform transformations with points, line segments and simple geometric figures on a co-ordinate plane, focusing on: – Reflection in the x-axis or y- axis – Reflection in the line $y = x$ – Translation within and across quadrants		**AREA AND PERIMETER OF 2-D SHAPES** • Use appropriate formulae and conversions between SI units, to solve problems and calculate perimeter and area of: – Polygons – Circles		**SURFACE AREA AND VOLUME OF 3D OBJECTS** • Use appropriate formulae and conversions between SI units to solve problems and calculate the surface area, volume and capacity of: – Rectangular prisms – Triangular prisms – Cylinders cylinders		**REVISION**	**FORMAL ASSESSMENT TASK** **EXAMINATION PAPER 1 AND PAPER 2** All topics from term 1-4		
PREREQUISITE SKILL OR PRE-KNOWLEDGE	• Translations, reflections, rotations enlargements and reductions with geometric figures and shapes on grid paper		• Determine whether a triangle is a right-angled triangle or not if the length of the three sides of the triangle is known • Use the Theorem of Pythagoras to calculate a missing length in a right-angled triangle, leaving irrational answers in surd form • Use of appropriate formulae to calculate perimeter and area of polygons to include circles to at least 2 decimal places and convert between appropriate SI units, including and up to km^2 • Calculate perimeter and area of complex figures		• Use of appropriate formulae to calculate the surface area, volume and capacity of cubes and rectangular prisms • Describe the interrelationship between surface area and volume of the objects mentioned above • Use and convert between appropriate SI units, including: – $mm^2 \leftrightarrow cm^2 \leftrightarrow m^2 \leftrightarrow km^2$ – $mm^3 \leftrightarrow cm^3 \leftrightarrow m^3$ – $ml\ (cm^3) \leftrightarrow l \leftrightarrow kl$					