basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ANNUAL NATIONAL ASSESSMENT 2015
ASSESSMENT GUIDELINES
MATHEMATICS
GRADE 9

INTRODUCTION

The 2015 cycle of Annual National Assessment (ANA 2015) will be administered in all public and designated[1] independent schools in September 2015. During this period all learners in the Senior Phase will write nationally set tests in Language and Mathematics. The results will be used to report progress related to achieving the goals set in the *Action Plan 2014, Towards Schooling 2025*.

The ANA tests will be written during the third school term. Therefore, the Department of Basic Education (DBE) has developed Assessment Guideline documents for Language and Mathematics in each grade. These guidelines outline the minimum curriculum content that must be covered by all learners prior to the writing of the test. The Assessment Guidelines set the limits of the scope of work that will be covered in the test for each grade and subject. The ANA 2015 Assessment Guidelines have been designed in line with the Curriculum and Assessment Policy Statement (CAPS).

SENIOR PHASE: Grade 9

In Grade 9, the test will cover topics that are prescribed in CAPS for the **first three terms** of the school year. It is important to note that the ANA 2015 Assessment Guidelines do not imply that the limited scope is all that must be taught and learnt during the school year. Instead, the Assessment Guidelines provide the topics, excluding Surface Area and Volume of 3-D objects that should have been covered by the end of the third school term. There will only be one non-routine question in the ANA test.

For this grade the Assessment Guidelines are arranged in four columns. The content area is listed in the first column, the topics are listed in the second column, the concepts and skills are listed in the third column and the descriptive statements are indicated in the fourth column.
Teachers are expected to use these Guidelines together with the CAPS to ensure that all the topics that will be assessed have been covered.

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[1] "Designated" independent schools are those that will apply and register either their Grade 3 or Grade 6 learners to participate in ANA for purposes of securing State subsidy.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
Number operations and relationships	Whole numbers	Properties of numbers	recognising, defining and distinguishing properties of: ● natural numbers ● whole numbers ● integers ● rational numbers ● irrational numbers
	Whole numbers	Multiples and factors	using prime factorisation of numbers to determine the LCM and/ or HCF of numbers.
	Whole numbers	Problem solving	solving problems in context involving ● ratio and/ or rate. ● direct and/or indirect proportion.
	Whole numbers		solving problems that involve whole numbers, percentages and decimal fractions in financial context such as: ● Percentage increase or decrease ● profit, loss, discount and VAT ● simple interest ● compound interest
Number operations and relationships	Integers	Problem solving	solving problems in context involving multiple operations with integers.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
	Common fractions	Calculations using fractions	performing calculations involving all four operations with common fractions and mixed numbers.
			performing calculations involving all four operations with numbers that involve squares, cubes, square roots and/or cube roots of common fractions.
Number operations and relationships	Decimal fractions		solving problems in context involving common fractions, mixed numbers and/or percentages.
		Calculations with decimal fractions	performing multiple operations with decimal fractions, using a calculator where appropriate.
			performing multiple operations with or without brackets with numbers that involve the squares, cubes, square roots and/or cube roots of decimal fractions.
		Problem solving	solving problems in context involving decimal fractions.
Number operations and relationships	Exponents	Scientific notation	Scientific notation of very large and small numbers.
		Laws of exponents	using laws of exponents to simplify as well as expanding algebraic expressions.
		Solving problems	solving problems in context involving numbers in exponential form, including scientific notation with or without using a calculator.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
Patterns, Functions and Algebra	Numeric and geometric patterns	Investigate and extend patterns	investigating and extending numeric and/or geometric patterns looking for relationships between numbers including patterns: ● represented in diagram form ● not limited to sequences involving a constant difference or ratio. ● represented in tables ● represented algebraically
			describing and justifying the general rules for observed relationships between numbers in own words or in algebraic language.
	Functions and relationships	Input and output values	determining input values, output values or rules for patterns and relationships using: ● tables ● formulae ● equations
		Equivalent forms	determining, interpreting and justifying equivalence of different descriptions of the same relationship or rule presented. ● in tables ● by formulae ● by equations ● by graphs on a Cartesian plane
	Algebraic expressions	Algebraic language	recognising and identifying coefficients and exponents in algebraic expressions.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
		Expand and simplify algebraic expressions	adding and/ or subtracting like terms in algebraic expressions.
		Expand and simplify algebraic expressions.	multiplying and dividing polynomials by: ● integers ● monomials ● binomials ● trinomials
			determining the product of two binomials and the square of the binomial.
			simplifying algebraic expressions involving addition, subtraction, multiplication and/ or division.
			determining the squares, cubes, square roots and/or cube roots of single algebraic terms or like algebraic terms.
			determining the numerical value or algebraic expressions by substitution.
		Factorise algebraic expressions.	factorising 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
		Factorise algebraic expressions	simplifying algebraic expressions and algebraic fractions using factorisation.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
	Algebraic equations	Equations	solving equations: • by inspection • using additive and multiplicative inverses • using laws of exponents • using factorisation to write equations in the form: a product of factors $= 0$
			use substitution in equations to generate tables of ordered number pairs.
			setting up and solving equations to describe problem situations.
Patterns, Functions and Algebra	Graphs	Interpreting graphs	linear graphs with special focus on the following features: • x – intercept and y – intercept • Gradient
			draw linear graphs from given co-ordinate of points or equations.
Patterns, Functions and Algebra	Graphs		determining equations from given graphs.
Space and Shape (Geometry)		Angle relationship	recognising and describing pairs of angles formed by perpendicular lines, intersecting lines and/or parallel lines cut by a transversal.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
Space and Shape (Geometry)	Geometry of straight lines	Problem solving	Solving geometric problems using relationships between pairs of angles formed by: ● perpendicular lines ● intersecting lines ● and/or parallel lines cut by transversal
			solving 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.
Space and Shape(Geometry)	Geometry of 2-D shapes	Classifying 2- D shapes	determining the properties and definitions of triangles in terms of their sides and angles distinguishing between: ● equilateral triangles ● isosceles triangles ● right-angled triangles.

CONTENT AREA	TOPICS	CONCEPTS AND SKILLS	Descriptive Statements The learner will be assessed on:-
Space and Shape (Geometry)		Conditions for congruency of triangles.	identifying, naming or proving congruency of triangles.
		Conditions for similarity of triangles.	identifying, naming or proving similarity of triangles.
			giving the outcomes of the stated similarity.
Measurement	Theorem of Pythagoras	Solve problems using the Theorem of Pythagoras.	using the Theorem of Pythagoras to solving problems involving unknown lengths in geometric figures that contain right-angled triangles.
	Perimeter and area of 2-D shapes	Perimeter of polygons and area of squares, rectangles, triangles and/or circles.	using appropriate formulae and conversions between SI units to solve problems and calculate perimeters and areas of ● polygons ● circles.
			investigating how doubling any or all of the dimensions of a 2 – D figure affects its perimeter and its area.