ZIMBABWE

MINISTRY OF PRIMARY AND SECONDARY EDUCATION

MATHEMATICS SYLLABUS

FORMS 1 - 4

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CONTENTS

1.0 PREAMBLE

1.1 Introduction

In developing the Mathematics syllabus attention was paid to the need to provide continuity of mathematical concepts from primary school level to form 4 and lay foundations for further studies and career development. It is intended to produce a citizen who is a critical thinker and problem solver in everyday life. The four year learning area will provide learners with opportunities to apply mathematical concepts to other learning areas and enhance mathematical literacy and numeracy. It also desires to produce a learner with the ability to communicate effectively, with proper qualities of team work. In learning mathematics, learners should understand and master a variety of skills, knowledge, concepts and processes in order to investigate and interpret numerical and spatial relationships and patterns that exist in the world. It also caters for learners with diverse needs to experience mathematics as relevant and worthwhile.

1.2 Rationale

Zimbabwe is undergoing a socio-economic transformation where mathematics is key to development, therefore, it is imperative that learners acquire necessary mathematical knowledge, skills and develop a positive attitude towards the learning area. This will enable learners to be creative thinkers, problem solvers and communicators with values of unhu/vumunhu/Ubuntu such as discipline, integrity and honesty . The knowledge of mathematics enables learners to develop mathematical skills such as accuracy, research, logical and analytical competencies essential for sustainable development and in life. The importance of mathematics can be underpinned in inclusivity and human dignity and is a universal language that cuts across all boundaries and unifies diverse cultures. Mathematics plays a pivotal role in careers such as entreprise, education, medicine, agriculture, meteorology, engineering and others.

1.3 Summary of Content

The syllabus covers the theoretical and practical broad mathematical concepts. The syllabus covers operations with real numbers, manipulation of algebraic symbols and techniques, formulating and solving equations, drawing and interpreting graphs and making inferences from statistical data and representation.

1.4 Assumptions

In developing the syllabus it is assumed that the learner has :

- completed primary education
- basic knowledge of primary mathematics syllabus concepts such as:
  - number
  - operations
  - measures
  - relationships
- ability to use ICT tools

1.5 Cross Cutting themes

The following are some of the cross cutting themes in Mathematics:

- Business and financial literacy
- Disaster and risk management
- Communication and team building
- Environmental issues
- Gender
- Enterprise skills
- HIV & AIDS
- ICT
- Unhu/Ubuntu/Vumunhu

2.0 PRESENTATION OF SYLLABUS

The mathematics syllabus is a single document covering Forms 1 to 4 . It contains the preamble, aims, assessment objectives, syllabus topics, scope and sequence and competency matrix. The syllabus also suggests a list of resources to be used in the learning and teaching process.

3.0 AIMS

The syllabus will enable learners to:

- develop an understanding of mathematical concepts and processes in a way that encourages confidence, enjoyment and interest
- further acquire appropriate mathematical skills and knowledge
- develop the ability to think clearly, work carefully and communicate mathematical ideas successfully
  - apply mathematics in other learning areas and in life

- develop an appreciation of the role of mathematics in personal, community and national development
- engage, persevere, collaborate and show intellectual honesty in performing tasks in mathematics, in the spirit of Unhu/ Ubuntu/Vumunhu
- use I.C.T tools to solve mathematical problems

4.0 SYLLABUS OBJECTIVES

The learners should be able to:

- use mathematical symbols, terms and definitions in problem solving
- construct appropriate mathematical models that can be applied in solving problems in life
- draw inferences through manipulation of mathematical data
- communicate mathematical ideas and information clearly and effectively in various contexts
- solve a wide range of problems involving algebraic and geometric concepts
- apply mathematical concepts in other learning areas
- use I.C.T tools in problem solving
- conduct research projects including those related to enterprise

5.0 METHODOLOGY AND TIME ALLOCATION

It is recommended that teachers use teaching techniques in which mathematics is seen as a process which arouse an interest and confidence in solving problems in both familiar and unfamiliar contexts. The teaching and learning of mathematics must be learner centred. Multi-sensory principles should also be applied during teaching and learning of mathematics. The following are some of the suggested methods of the teaching and learning of mathematics

- Guided discovery
- Discussion
- Interactive e-learning
- Exposition
- Demonstration and illustration
- Problem solving
- Individualisation
- Simulation
- Visual tactile
- Educational tours
- Expert guest presentation

5.1 Time Allocation

Six periods of 40 minutes each per week should be allocated for the adequate coverage of the syllabus.

6.0 TOPICS

The following topics will be covered from Form 1 to 4

6.1 Real Numbers
6.2 Sets
6.3 Financial Mathematics
6.4 Measures and Mensuration
6.5 Graphs
6.6 Variation
6.7 Algebra
6.8 Geometry
6.9 Statistics
6.10 Trigonometry
6.11 Vectors
6.12 Matrices
6.13 Transformation
6.14 Probability

7.0 SCOPE AND SEQUENCE

7. 1 REAL NUMBERS

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Number Concepts and Operations	• Number types • Factors and multiples • Directed numbers • Fractions and percentages • Order of operations	• Factors and multiples • Squares and square roots • Cubes and cube roots	• Order of operations • Irrational numbers • Number patterns	
Approximations and estimations	• Round off numbers • Decimal places	• Significant figures • Estimations	• Significant figures • Estimations • Limits of accuracy	
Ratios, rates and proportions	• Ratios	• Ratios • Proportions	• Ratios • Rates • Proportions	
Ordinary and standard form	• Large and small numbers	• Numbers in standard form	• Operations in standard form	
Number bases	• Number bases in everyday life • Place values	• Converting numbers from one base to another (Bases 2, 5 and 10)	• Operations in number bases from base 2 to base 10	
Scales and simple map problems	• Scale measurement	• Scale drawing	• Scale factor • Area factor	

7. 2Sets

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Sets	• Sets and Set notation • Types of sets	• Types of sets • Venn diagram with two subsets	• Set Builder Notation • Venn diagrams with three subsets	

7.3 Financial Mathematics

TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Consumer arithmetic	• Household bills • Profit and loss • Discount • Household budgets	• Corporate bills • Profit and loss • Simple interest • Hire purchase • Small scale enterprise budgets	• Bank statements • Compound interest • Commission • Hire purchase	• Foreign exchange • Sales and income tax rates (Pay as you earn (PAYE)) • Value added tax (VAT) • Customs and Excise Duty

7.4 Measures and Mensuration

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Measures	• Units of : - Time - Mass - Length - Temperature - Capacity	• Units of: - Area - Volume - Capacity - Density		
Mensuration	• Perimeter of plane shapes • Area of plane shapes	• Perimeter of plane shapes • Area of plane shapes • Volume of cuboids • Density of cuboids	• Perimeter of combined shapes • Area of combined shapes • Volume of cylinders	• Area and volumes of solid shapes • Surface area • Density

7.5 Graphs

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Functional Graphs	• Cartesian plane • Scale • Co-ordinates	• Cartesian plane • Table of values • Linear graphs • Scale	• Functional Notation • Linear graphs • Quadratic graphs	• Cubic graphs • Inverse graphs
Travel Graphs	• Distance time graphs	• Distance time graphs	• Distance time graphs • Speed-time graphs	• Displacement time graphs • Velocity-time graphs

7.6 Variation

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Variation		• Direct variation	• Direct variation • Inverse variation	• Joint variation • Partial variation

7.7 Algebra

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Algebraic Manipulation	• Basic arithmetic processes in letter symbols • Substitution of values • Algebraic expressions	• Substitution of values • Algebraic expressions • Algebraic fractions • Quadratic expressions • Factorisation	• Algebraic fractions • Highest Common Factor (HCF) and Lowest Common Multiple (LCM) of algebraic expressions • Quadratic expressions • Factorisation	• Algebraic fractions • Quadratic expressions • Factorisation • Completing the square
Equations	• Linear equations	• Equations with brackets • Equations with fractions • Change of subject of formulae • Simultaneous linear equations • Quadratic equations	• Simultaneous equations • Quadratic equations • Change of subject of formulae • Substitution of values	• Completing the square • Quadratic formulae
Inequalities	• Inequality signs • Linear inequalities • Number line	• Linear inequalities • Number line • Cartesian plane	• Simultaneous inequalities • Graphs of inequalities	• Linear programming
Indices and Logarithms	• Index form	• Laws of indices	• Indices • Logarithms • Theory of logarithms • Equations involving indices and logarithms	

7. 8 Geometry

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Points, lines and angles	• Points • Lines • Angles	• Angles • Parallel and Transversal lines	• Angles of elevation and depression	
Bearing		• Cardinal points • Three figure bearing • Compass bearing	• Three figure bearing • Compass bearing	
Polygons and circles	• Polygons • Circles	• Properties of polygons (triangles and quadrilaterals)	• Properties of polygons • Angles of polygons • Numbers of sides of polygons	• Circle theorems
Similarity and Congruency		• Similar and congruent figures • Cases of congruency	• Scale factor • Areas of similar figures • Volume and mass of similar solids	
Constructions and Loci	• Construction of lines and angles	• Construction of angles • Bisecting lines and angles	• Construction of triangles and quadrilaterals	• Construction of diagrams to a given scale • Loci
Symmetry		• Line symmetry in two dimensions	• Rotational symmetry in two dimensions	

7.9 Statistics

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Data collection, classification and representation	• Data collection • Data classification	• Data collection • Classification of ungrouped data • Representing data using frequency tables, bar charets and pie charts	• Collection and classification of grouped data • Frequency table • Pie chart • Histogram • Frequency polygon • Bar chart	• Frequency table • Frequency polygon • Cumulative frequency table • Cumulative frequency curve
Measures of central tendency		• Mean • Class mode • Median • Assumed mean	• Mean, median and modal class of grouped data • Assumed mean	• Median from cumulative frequency curve
Measures of Dispersion				• Quartiles • Inter quartile range • Semi- inter quartile range

7.10 Trigonometry

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Pythagoras theorem			• Pythagoras theorem • Pythagorian trippleS	
Trigonometrical ratios			• Trigonometrical ratios of acute angles: - sine - cosine - tangent • Trigonometrical ratios of obtuse angles: - sine - cosine - tangent	• Cosine rule • Sine rule • Area of triangleS

7.11 Vectors

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Definition and Notation		• Definition of vectorS • Vector notation		
Types of Vectors		• Translation vectors • Negative vectors • Equal vectors • Parallel vectors	• Translation vectors • Negative vectors • Equal vectors • Parallel vectors • Position vectors	
Operations		• Addition of vectors • Subtraction of vectors	• Addition of vectors • Subtraction of vectors • scalar multiplication • Magnitudeof vectors • Combined vector operations	• Vector properties of plane shapes

7.12 Matrices

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Order		• Order of matrices • Types of matrices		
Operations			• Addition and subtraction of matrices • Scalar multiplication of matrices • Multiplication of matrices	
Determinants			• Determinants of matrices • Singular and non-singular matrices	
Inverse matrix			• Inverse of a matrix • Simultaneous linear equations in 2 variables	

7.13 Transformation

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Translation	• Translation of plane figures	• Translation vector to move a point	• translation vector to move a plane figure on a Cartesian plane	
Reflection		• Reflection of plane figures	• Reflection of plane figures on a cartesian plane in the x-axis, y-axis, and lines of the form y=a and x=b	• Reflection of plane figures in any line and using matrices
Rotation			• Rotation of plane figures on a Cartesian plane by geometric methods	• Rotation of plane figures by drawing and use of matrices
Enlargement			• Enlargement about the origin using a rational scale by geometric methods	• Enlargement using matrices and about any point using a rational scale
Stretch				• One-way and two-way stretch using matrices and geometrical methods
Shear				• Shear using matrices and geometrical methods

7. 14 Probability

SUB TOPIC	FORM 1	FORM 2	FORM 3	FORM 4
Probability		• Definition of probability terms • Experimental probability	• Experimental probability • Theoretical probability • Single events	• Combined events • Outcome tables • Tree diagrams • Probability rules • Application of probability

FORM ONE (1)

8.0 COMPETENCY MATRIX

8.1 Real numbers

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Number Concepts and operations	• identify types of numbers • find factors and multiples of numbers • find H.C.F. and L.C.M • operate with directed numbers • apply directed numbers to practical situations in life • operate with fractions • convert fractions to decimals • convert fractions to percentages and vice versa • carry out calculations involving percentages • carryout mixed operations using the rule of precedence	• Number types • Factors and multiples • Directed numbers • Fractions and percentages • Order of Operations	• Identifying and listing types of numbers • Listing factors and multiples of numbers • Finding H.C.F and L.C.M • Using a number line on the operation of directed numbers • Performing operations involving fractions • Converting fractions to decimals • Converting fractions to percentages • Calculations involving decimals and percentages • Calculations involving mixed operations using rules of precedence	• Relevent Texts • ICT Tools • Braille material and Equipment • Talking books/software
Approximation and estimation	• round off numbers to the given place value	• Whole numbers • Decimal numbers	• Rounding off numbers	• Relevant texts • ICT tools

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
	• round off numbers to the given decimal places			• Braille materials and equipment • Talking books/software
Ratios, rates and proportions	• simplify ratios • solve problems involving ratios	• Ratio	• Expressing ratios in their simplest forms • Discussing the use of ratios in life • Solving problems involving ratios	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Ordinary and standard form	• express small and large numbers in digits and words	• Large and small numbers	• expressing small and large numbers in digits and words	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Number bases	• identify Number bases in everyday life place • find place values for common bases	• Number bases in everyday life place • Place values	• Identify number bases in everyday life place • finding plavce values for common bases	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Scales and simple map problems	• identify types of scales • find scales from given information • measure lengths using a given scale	• Representative Fraction • Ratio scale	• Identifying types of scales • Measuring lengths using given scales	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.1. 2 Sets

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Sets and Set notation	• define a set by listing the elements • describe given sets using set notation	• Sets and set notation	• Listing elements of various sets • Discussing examples of sets in life • Explaining the meanings of set notation and their uses • Using set notation to describe sets	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Types of Sets	• describe the types of sets • illustrate the types of sets by means of diagrams • form subsets from universal sets • discuss union and intersection of sets	• Universal set • Finite set • Infinite set • Null or empty set • Equal sets • Subset • Union of a set • Intersection of a set	• Discussing the types of sets • Distinguishing the types of sets • Forming subsets from universal set • Discussing union and intersection of sets	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.1.3 Financial Mathematics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Consumer arithmetic	• interpret bills • extract data from household bills for calculations • calculate profit and loss • calculate discount • prepare household budgets	• Household bills • Profit and loss • Discount • Household budgets	• Interpreting household bills • Solving problems involving household bills • Calculating profit and loss • Calculating discount • Preparing and discussing household budgets	• Relevant texts • ICT • Environment • Braille materials and equipment • Talking books/software

8.1. 4 Measures and mensuration

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Measures	• use the units of measurement in life • make calculations using the units of measument • convert units of measurement from one form to another • solve problems using the units of measurement	• units of: - Time - Mass - Length - Temperature - Capacity	• Using the units of measurement in life • Making calculations using the units of measument • Converting units of measurement from one form to another • Solving problems using the units of mesurement	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Mensuration	• find perimeter of plane shapes • calculate area of plane shapes • solve problems involving plane shapes	• perimeter of plane shapes • Area of plane • shapes	• Finding the perimeter of plane shapes • Calculating area of plane shapes • Using the area and perimeter of plane shapes to solve problems in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.1. 5 Graphs

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Functional graphs	• draw the Cartesian plane using a given scale • identify points on the Cartesian plane • state points in co-ordinate form • plot points on the Cartesian plane	• Cartesian plane • Scale • Co-ordinates	• Drawing Cartesian plane using given scale • Identifying points on the Cartesian plane and stating them in co-ordinate form • Plotting points on the Cartesian plane	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software • Geo-board • Mathematical instruments
Travel graphs	• interpret distance time graphs	• Distance time graphs	• Discussing distance time graphs • Solving problems involving distance time graphs	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software • Geo-board • Mathematical instruments

8.1.6 Algebra

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Algebraic Manipulation	• simplify algebraic expressions using the rules of basic operations • substitute values in algebraic terms • find H.C.F of linear algebraic expressions • solve problems involving algebraic expressions	• Basic algebraic processes • Substitution of values • Algebraic expressions	• simplifying algebraic expressions using the rules of basic operations • substituting values in algebraic expressions • find H.C.F of linear algebraic expressions • solving problems involving algebraic expressions	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Equations	• solve linear equations where the unknown appears on one side • solve linear equations where the unknown appears on both sides of the equation • formulate linear equations from given information	• Linear equations	• Solving linear equations where the unknown appears on one side including word problems • Solving linear equations where the unknown appear on both sides including word problems • Formulating linear equations from given information	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Inequalities	• explain the meaning of inequality signs • represent linear inequalities on a number line • formulate linear inequalities • solve linear inequalities	• Inequality signs • Linear inequalities • Number line	• Discussing the meaning and use of inequality signs • Representing linear inequalities on a number line • Formulating linear inequalities • Solving linear inequalities	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.1.6 Algebra Contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Indices and logarithms	• express numbers from ordinary to index form and vice versa	• Index form	• Expressing numbers from ordinary to index form and vice versa	• Relevant texts • ICT • Braille materials and equipment • Talking books/software

8.1.7 Geometry

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Points, lines and angles	• Define a point • Identify types of lines • identify types of angles • measure angles • calculate angles on a straight line and around a point • solve problems involving angles on a straight line and around a point	• Points • Lines • Angles	• Discussing a point • Discussing types of lines and angles • Measuring angles • Calculating angles on a straight line and around a point • Solving problems involving angles on a straight line and around a point	• Geometrical Instruments • Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Polygons and circles	• define a polygon • state the names of n-sided polygons (up to n=10) • name parts, lines and regions in a circle	• Polygons • Circles	• Discussing polygons with up to ten sides • Drawing and naming parts of a circle	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Construction and loci	• construct lines and angles	• Construction of lines and angles	• Constructing lines and angles	• Geometrical instruments • ICT tools • Relevant texts • Braille materials and equipment • Talking books/software

8.1. 8 Statistics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Data collection and classification and representation	• collect statistical data • classify statistical data • describe the use of case studies/ questionnaire to collect data	• Data collection • Data classification	• Collecting statistical data • Classifying statistical data • Discussing the use of case studies/ questionnaire to collect data	• Relevant texts • Environment • ICT tools • Braille materials and equipment • Talking books/software

8.1. 9 Transformation

SUB TOPIC	Learning OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Translation	• define transformation • define translation • translate plane figures	• Translation of plane figures	• Defining transformation and translation • Translating plane figures	• Relevant texts • Geo-board • ICT tools • Braille materials and equipment • Talking books/software

8.2 FORM (2)

8.2 1 Real Numbers

SUB TOPIC	OBJECTIVES learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Number concepts and operations	• find H.C.F. and L.C.M. • calculate squares and square roots • calculate cubes and cube roots	• Factors and multiples • Squares and square roots • Cubes and cube roots	• Finding H.C.F and L.C.M. • Computing squares and square roots • Calculating cubes and cube roots	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Approximation and estimation	• round off numbers to given significant figures • solve problems involving approximation and estimation	• Significant figures • Estimations	• Rounding off numbers to required significant figures • Using approximation and estimation to solve problems	• Relevant Texts • ICT tools • Braille materials and equipment • Talking books/software
Ratios rates and proportions	• simplify ratios • solve problems using the concept of ratio • distinguish between direct and inverse propotion • solve problems that involve direct and inverse proportion	• Ratios • Proportions	• Discussing the use of ratios in life situations • Discussing examples of direct and inverse proportion • Distinguishing between direct and inverse propotion • Solving problems that involve ratios and proportion	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2 1 Real Numbers Contd..

Ordinary and standard form	• express numbers in ordinary form to standard form and vise versa	• Numbers in standard form	• Discuss importance of standard form in life • Expressing numbers in standard form	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Number bases	• convert a number in any base to base ten • convert a number in base ten to any base • solve problems in life using number bases	• converting numbers from one base to another	• Converting number bases • Identifying numbers in their respective bases • Solve problems in life using number bases	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Scales and simple map problems	• discuss types of scales • find scales from given information • make measurements using a given scale • draw lines or diagrams to a given scale • calculate distances using a given scale	• Scale drawings	• Identifying types of scales • Measuring lengths using given scales • Making scale drawings using appropriate/given scale • Calculating distances • Solve problems in familiar and less familiar context using the concept of scales	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2.2 Sets

SUB TOPIC	Learning OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Sets	• find union and intersection of sets • represent sets on Venn diagrams • convert word problems into set notation • solve life problems using a Venn diagram with no more than 2 subsets	• Types of sets • Venn diagram with two subsets • Set notation	• Finding union and intersection of sets • Discussing word problems in relation to set notation • Representing given information on Venn diagram • Solve problems using Venn diagrams	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.2.3 Financial Mathematics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Consumer arithmetic	• interpret bills • make calculations based on data from corporate bills • calculate profit and loss • find simple interest • prepare an enterprise budget for a small business • solve problems involving hire purchase	• Corporate bills • Profit and loss • Simple interest • Hire purchase • Small scale enterprise budgets	• Discussing corporate bills • Making calculations based on data extracted from corporate bills • Calculating profit and loss • Finding simple interest • Preparing an enterprise budget for a small business • Solving problems involving hire purchase	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2.4 Measures and Mensuration

SUB TOPIC	Learning OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Measures	• use the units of measurements in life • solve problems using the different units of measurements	• Units of: - Area - Volume - Capacity - Density	• Discussing the importance of units of measurements in life • Solving problems using the different units of measurements	• Relevant texts • Environment • ICT tools • Braille materials and equipment • Talking books/software
Mensuration	• calculate perimeter of plane shapes • calculate area of plane shapes • calculate volumes of cuboids • solve problems involving area and volumes • solve simple density problems	• Perimeter of plane shapes • Area of plane shapes • Volume of cuboids • Density of cuboids	• Calculating perimeter and area of plane shapes • Calculating volume of cuboids • Solving problems involving area and volume in life • Solving simple density problems	• Relevant texts • Environment • ICT tools • Braille materials and equipment • Talking books/software

8.2. 5 Graphs

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Functional graphs	• draw the Cartesian plane, using a given scale • plot points on the Cartesian plane • construct a table of values for a given linear function • draw straight line graphs	• Cartesian plane • Table of values • Linear graphs • Scale	• Drawing the Cartesian plane, using a given scale • Plotting points on the Cartesian plane • Constructing table of values • Drawing straight line graphs on the Cartesian plane	• Relevant texts • Geo-board • Mathematical instruments • Braille materials and equipment • Talking books/software • ICT tools
Travel graphs	• interpret distance - time graphs • draw distance - time graphs • use distance-time graphs to solve problems	• Distance time graphs	• Interpreting distance time graphs • Drawing distance time graphs • Using distance-time graphs to solve problems	• Relevant texts • Geo-board • Mathematical instruments • Braille materials and equipment • Talking books/software • ICT Tools

8.2.6 Variation

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Variation	• express direct variation in algebraic terms • solve problems involving direct variation	• Direct variation	• Discussing the concept of direct variation • Expressing direct variation in algebraic terms • Discussing relationships between variables • Solving problems involving direct variation	• Relevant texts • Environment • ICT tools • Braille materials and equipment • Talking books/software

8.2.7 Algebra

SUB TOPIC	OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Algebraic Manipulation	• substitute values in algebraic terms • factorise linear algebraic expressions • factorise quadratic algebraic expressions • simplify algebraic fractions • expand algebraic expressions with bracket • solve problems involving algebraic manipulations	• Substitution of values • Algebraic expressions • Algebraic fractions • Quadratic expressions • Factorisation	• Substituting valus in algebraic terms • Factorising linear and quadratic algebraic expressions • Simplifying algebraic fractions • Expanding algebraic expressions with brackets • Solving problems involving algebraic manipulations	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Equations	• simplify equations with brackets • carry out calculations involving change of subject of formulae • solve equations with algebraic fractions • solve simultaneous linear equations • solve quadratic equation where the coefficient of x^2 is one	• Equations with brackets • Equations with fractions • Change of subject of formulae • Simultaneous linear equations • Quadratic equations	• Expanding and solving equations with brackets • Carrying out calculations involving change of subjects of formulae • Solving equations involving algebraic fractions • Solving simultaneous linear equations • Solving quadratic equations where the coefficient of x^2 is one	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.2.7 Algebra Contd..

Inequalities	• represent linear inequalities on a number line • formulate linear inequalities • represent inequalities on a Cartesian plane • solve linear inequalities	• linear inequalities • Number line • Cartesian plane	• Representing linear inequalities on a number line • Formulating linear inequalities • Identifying inequalities represented on a Cartesian plane • Solving linear inequalities	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Indices and logarithms	• Carry out calculations involving laws of indices ($x^a \times x^b$; $x^a \div x^b$; x^o and $x^{-a)}$ • solve problems involving indices using the laws of indices	• Laws of indices	• Finding squares and square roots of given numbers in index form • Applying the laws of indices to algebraic expressions • Solving problems involving indices using the laws of indices	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.2.8 Geometry

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Points,lines and angles	• identify the types of angles formed on parallel and transversal lines • calculate unknown angles on parallel and transversal line using geometrical facts	• Angles • Parallel and Transversal lines	• Discussing angles formed on parallel and transversal lines • Calculate angles on parallel and tranversal lines	• Relevant texts • ICT tools • Geo-board • Braille materials and equipment • Talking books/software
Bearing	• identify cardinal points • give directions using cardinal points • find compass bearing of points • calculate three-figure bearing of points • solve problems in life involving bearing	• Cardinal points • Three-figure bearings • Compass bearing	• Discussing cardinal points • Discussing importance of compass in life • Finding compass bearings • Calculating three-figure bearings • Solving problems in life involving bearing	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2.8 Geometry Contd..

Polygons and Circles	• state the names of n-sided polygons (up to n=10) • describe the properties of triangles and quadrilaterals	• Properties of polygons (triangles and quadrilateral)	• Naming polygons with up to ten sides • Stating properties of triangles and quadrilaterals	• Relevant texts • Environment • ICT tools • Braille materials and equipment • Talking books/software
Similarity and congruency	• identify similar and congruent figures • state cases of congruency • solve problems involving similar and congruent figures	• Similar and congruent figures • Cases of congruency	• Identifying similar and congruent figures • Discussing cases of congruency • Solving problems involving similar and congruent figures	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software
Construction and loci	• construct lines and angles • bisect lines and angles	• Construction of lines and angles • Bisecting lines and angles	• Constructing lines and angles • Bisecting lines and angles • Representing life phenomena using mathematical models involving construction and exploring their application in life ▪	• Geometrical instruments • ICT tool • Relevant texts • Braille materials and equipment • Talking books/software
Symmetry	• identify lines of symmetry of regular polygons • draw lines of symmetry on plane shapes	• line symmetry in two dimensions	• Stating number of lines of symmetry • Drawing shapes and showing lines of symmetry	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.2. 9 Statistics

SUB TOPIC	LEARNING OBJECTIVES learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Data collection, classification and representation	• collect data • group statistical data • represent data using frequency table, bar chart and pie chart	• Data collection • Classification of ungrouped data • Representing data using frequency table, bar chart and pie chart	• Discussing collected data • Grouping statistical data • Representing data using frequency table, bar chart and pie chart • Conducting educational tours	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Measures of central tendency	• define measures of central tendency • state the mode in a given distribution • calculate the mean and median • calculate mean using assumed means	• Mean • Mode • Median • Assumed mean	• Discussing the meanings of the measures of central tendency • Determining the mode in a given distribution • Calculating the mean and median • Calculating mean using assumed mean • Representing life phenomena using mathematical models involving the measures of central tendency and exploring their applications in life	• Relevant texts • ICT tools • Braille materials and equipment • Talking books/software

8.2.10 Vectors

SUB TOPIC	LEARNING OBJECTIVES learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Definition and notation	• define vector • interpret vector notation	• Definition of vectors • Vector notation	• Discussing vectors • Expressing vectors in column form • Representing vectors using vector notation	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Types of vectors	• identify various types of vectors • represent translation vector in column form • draw translation vector on a Cartesian plane • solve problems using the concept of vectors	• Translation vectors • Negative vectors • Equal vectors • Parallel vectors	• Discussing the various types of vectors • Representing a translation by column vectors • Drawing translation vector on a Cartesian plane • Identifying various types of vectors from the Cartesian plane • Solving problems using the concept of vectors	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Operations	• add vectors • subtract vectors • solve problems involving addition and subtraction of vectors	• Addition of vectors • Subtraction of vectors	• Adding and subtracting vectors • Solving problems involving addition and subtraction of vectors	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2.11 Matrices

SUB TOPIC	LEARNING OBJECTIVES learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Order	• state the order of a given matrix • identify the different types of matrices • discuss the uses of matrices	• Order of matrices • Types of matrices	• Computing information in matrix form • Listing types of matrices • Discussing the order of matrices • Locate elements in a given matrix • Discussing the importance of matrices in life • Modelling life situation involving matrices to solve problems	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2.12 Transformation

SUB TOPIC	LEARNING OBJECTIVES **learners should be able to**:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Translation	• define transformation • describe translation • translate plane figures and points	• Translation vector to move a point and palne figures	• Discuss examples of transformation • Discussing the use of translation vector in translating figures • Translating plane figures and points defining a reflection	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Reflection	• define reflection • reflect a point or a plane figure in a given mirror line	• Reflection of plane figures	• Reflecting a point or object in a given mirror line • Representing life phenomena using mathematical models involving reflection transformation and exploring their applications in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.2.13 Probability

SUB TOPIC	LEARNING OBJECTIVES learners should be able to:	CONTENT (attitudes, skills and knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Definition of probability	• define probability and probability terms • calculate probability of single events • describe experimental probability • solve problems involving probability in life	• Definition of probability terms • Experimental probability	• Stating examples of each probability term • Calculating probability of single events • Carrying out probability experiments • Solving problems involving the concept of probability in life • Representing life phenomena using mathematical models involving the concept of probability and exploring their applications in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3 FORM THREE (3)

8.3.1 Real Numbers

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Number concepts and operations	• perform arithmetic operations using order of operations • identify rational and irrational numbers • distinguish between rational and irrational numbers • perform operations • identify number patterns in a sequence • solve problems involving irrational numbers	• Order of operations • Irrational numbers • Number patterns	• Applying the rules of precedence in real numbers • Performing operations • Differentiating between rational and irrational numbers • Exploring and discovering number patterns • Solving problems involving irrational numbers	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Ratios, rates and proportions	• simplify ratios • perform calculations involving ratio,rates and proportion • apply direct and inverse proportion to solve problems	• Ratio • Rates • Proportions	• Reducing ratios to simplest form and sharing quantities using ratio • Calculating and solving problems involving ratio,rate and proportion • Solving problems involving direct and inverse proportion focussing on life situations	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.1 Real Numbers Contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
			• Representing life phenomena using mathematical models involving the concept of ratios, rates and proportion and exploring their applications in life	
Ordinary and standard form	• perform operations in standard form	• Operations in standard form	• Adding and subtracting numbers in standard form • Dividing and multiplying numbers in standard form	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Number bases	• perform operations involving number bases	• Operations in number bases	• Adding and subtracting in number bases • Solving equations involving number bases	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Scales and simple map problems	• use given scales to calculate distance and area • solve problem involving distance and area using scale	• Scale factor • Area factor	• Calculating distance and area using given scales • Finding area factor given the scale factor • Finding scale factor given the area factor • Applying scales in solving problems in life situations	• Relevant texts • ICT tools • Environmen • Braille materials and equipment • Talking books/software

8.3. 2 Sets

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Sets	• describe sets using a set builder notation • draw Venn diagrams to show relationships in different subsets • solve problems using Venn diagrams	• Set builder notation • Venn diagrams up to three subsets	• Listing elements of sets • Using symbols of sets to describe sets • Describing sets using set builder notation • Demonstrating relationships of different subsets • Discussing Venn diagrams with up to three subsets • Solving problems involving Venn diagrams	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3. 3 Financial Mathematics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Consumer arithmetic	• interpret bank statements • calculate compound interest • calculate commission • solve problems on hire purchase	• Bank statements • Compound interest • Commission • Hire purchase	• Discussing the contents of the bank statements • Extracting data from bank statements to use it for calculations • Discussing compound interest, commission and hire purchase • Computing compound interest, commission and hire purchase	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.4 Measures And Mensuration

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Mensuration	• calculate perimeter of combined shapes • calculate area of combined shapes • calculate volume of cylinders	• Perimeter of combined shapes • Area of combined shapes • Volume of cylinders	• Calculating perimeter and area of combined shapes • Calculating volume of cylinders • Carrying out an experiment to show the relationship between mass and volume • Solving problems involving mass and volume	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3. 5 Graphs

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Functional graphs	• use the functional notation $f(x)$ in: - evaluating functions - solving linear and quadratic equations • draw graphs of linear and quadratic functions using: - table of values - axes intercepts • sketch: - straight line - quadratic graphs using axes intercepts • use graphs to find unknown values in linear and quadratic equations	• Functional notation • Linear graphs • Quadratic graphs	• Discussing use of functional notation using familiar functions • Drawing linear and quadratic graphs • Sketching straight line and quadratic graphs • Finding unknown values in linear and quadratic equations using the graph	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Travel graphs	• draw distance-time graphs • draw speed-time graphs • solve problems involving travel graphs	• Distance-time graphs • Speed-time graphs	• Discussing relationship involving distance, speed and time in everyday life • Drawing distance - time and speed - time graphs • Solving problems in life involving travel graphs	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.6 Variation

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Variation	• express inverse variation in algebraic terms • distinguish between direct and inverse variation • Illustrate direct and inverse variation using sketch graphs • solve problems involving variation	• Direct variation • Inverse variation	• Discussing relationships showing direct or inverse variation • Discussing examples of direct and inverse variations • Sketching graphs of direct and inverse functions • Solving problems involving variation	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.7 Algebra

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Algebraic Manipulation	• find HCF and LCM of algebraic expressions • simplify algebraic fractions • factorise quadratic expressions of the form $ax^2 + bx + c$ where $\|a\| > 1$ • factorise algebraic expressions	• Algebraic fractions • LCM and HCF of algebraic expressions • Quadratic expressions • Factorisation	• Finding LCM and HCF of algebraic expressions • Simplifying algebraic fractions • Factorising quadratic expressions • factorise algebraic expressions	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Equations	• solve linear simultaneous equations using: - elimination - substitution - graphical method • solve quadratic equations using: - factorisation - graphical methods • change the subject of formulae • substitute values in a given formulae	• Simultaneous equations • Quadratic equations • Change of subject o0f fdormulae • Substitution of values	• solving simultaneous linear equations using: - elimination - substitution - graphical method - solving quadratic equations using: - factorisation - graphical methods • solving problems from life situations using equations • changing the subject of formulae • substituting values in given formulae • Discussing change of subject and its applications	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.7 Algebra Contd..

Inequalities	• solve simultaneous linear inequalities in one variable • represent solution set on a line graph • solve simultaneous linear inequalities graphically	• Simultaneous inequalities • Graphs of inequalities	• Solving simultaneous linear inequalities in one variable • Representing solution set on a line graph • Representing linear inequalities in two variables on the Cartesian plane by shading the unwanted regions • Representing the solution set of simultaneous linear inequalities in a Cartesian plane	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Indices and logarithms	• simplify algebraic expressions involving indices • define logarithms • evaluate logathms • apply the laws of logarithms to evaluate logarithms • simplify expressions using laws of logarithms • solve equations involving indices and logarithms	• Indices • Logarithms • Theory of logarithms • Equations involving indices and logarithms	• Simplifying algebraic expressions involving indices • Discussing logarithms • Evaluating logarithms • Exploring laws of logarithms • Simplifying expressions using laws of logarithms • Solving equations involving Indices and logarithms	Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.8 Geometry

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Points, lines and angles	• construct angles of elevation and depression • solve problems on angles of elevation and depression	• Angles of elevation and depression	• Constructing angles of elevation and depression • Solving problems on angles of elevation and depression using scale drawing	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Bearing	• illustrate bearing on diagrams • solve problems involving three figure bearing and compass bearing	• Three - figure bearing • Compass bearing	• Constructing diagrams to show bearing • Solving problems involving three figure bearing and compass bearing • Locating the position of an object using three figure bearing and compass bearing	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Polygons	• describe properties of polygons • solve problems involving n-sided polygon • Apply the properties of n-sided polygons	• Properties of polygons • Angles of polygons • Number of sides of polygons	• Discussing properties of n-sided polygons • Solving problems involving n-sided polygons • Applying the properties of n-sided polygons	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Similarity and Congruency	• find the scale factor from two given similar shapes • calculate the length of sides of similar figures	• Scale factor • Areas of similar figures • Volume and mass of similar solids	• Discussing scale factor, area factor and volume factor • Computing lengths in similar shapes	• Relevant texts • ICT tools • Environment • Braille materials and equipment

8.3.8 Geometry contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
	• calculate the area of similar figures • calculate the volume and mass of similar solids		• Computing areas of similar shapes • Solving problems on volumes and masses of similar solids	• Talking books/software
Constructions and loci	• construct triangles • construct quadrilaterals • solve life problems using construction of triangles and quadrilaterals	• Triangles • Quadrilaterals	• Constructing triangles and quadrilaterals • Solving problems using construction of triangles and quadrilaterals	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software
Symmetry	• identify rotational symmetry in two dimensions • state the order of rotational/point symmetry in plane shapes • solve problems involving rotational symmetry	• Rotational symmetry in two dimensions	• Identifying rotational symmetry in two dimensions • Discussing rotational/point symmetry • Stating the order of rotational symmetry of plane shapes • Solving problems involving rotational symmetry in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/software

8.3.9 Statistics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Data Collection, Classification and Representation	• collect statistical data • group raw data into classes • state the class widths for the grouped data • construct frequency tables • draw bar chart, pie chart,histogram and frequency polygon • analyse information on the graphs	• Data collection and Classification of grouped data • Data representation - Frequency table - Bar graph - Pie chart - Histogram - Frequency polygon	• Collecting of statistical data • Conducting experiments to collect data • Classifying the collected data • Finding the class width of grouped data • Constructing frequency tables • Constructing graphs • Interpreting the graph	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Measures of Central Tendency	• compute the mean of grouped data • find the mode and median • calculate the mean using the assumed mean	• Mean, median and model class • Assumed mean	• Calculating the mean of grouped data • Computing the mean using the assumed mean • Finding the mode and the median • Explaining the significance of measures of central tendency	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.3. 10 Trigonometry

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Pythagoras theorem	• derive the Pythagoras theorem • solve right angled triangles by applying the Pythagoras theorem • show whether the given tripples are Pythagorean	• Pythagoras theorem • Pythagorean tripples	• Using the method of counting squares to derive the Pythagoras theorem • Finding the missing side in right angled triangles using Pythagoras theorem • Solving problems in everyday life using the Pythagoras theorem • Representing life phenomena using mathematical model involving Pythagoras Theorem and exploring its application in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Trigonometrical ratios	• find sine, cosine, tangent of acute angles • find sine, cosine, tangent of obtuse angles • solve problems involving right angled triangles in two dimensions	• Trigonometrical ratios of acute and obtuse angles - Sine - Cosine - Tangent	• Demosntrating whether the givcen triples are pyhthagoran • Calculating sine, cosine and tangent of acute and obtuse angles • Solving problems involving right angled triangles in two dimensions	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.3.11 Vectors

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Types of vectors	• describe types of vectors • represent types of vectors on Cartesian plane • identify various types of vectors on the Cartesian plane	• Translation vectors • Negative vectors • Equal vectors • Parallel vectors • Position vectors	• Discussing various types of vectors • Drawing different types of vectors on the Cartesian plane • Identifying different types of vectors on the Cartesian plane	• Relevant texts • ICT tools • Environment • Braille material equipment • Talking books/ software
Operations	• Add vectors • subtract vectors • multiply a vector by a scalar • calculate the magnitude of a vector • solve problems involving vector operations	• Addition of vectors • Subtraction of vectors • Scalar multiplication • Magnitude of vectors • Combined vector operations	• Manipulating vectors by adding and subtracting • Multiplication of a vector by a scalar • Computing the magnitude of a vector • Solving problems involving vectors	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.3.12 Matrices

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Operations	• add matrices • subtract matrices • multiply a matrix by a scalar • multiply matrices	• Addition and subtraction of matrices • Scalar multiplication of matrices • Multiplication of matrices	• Carrying out operations involving matrices • Using scalar quantities to multiply matrices • Solving problems involving matrices • Representing life phenomena using mathematical model involving matrices and exploring its application in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Determinants	• find the determinant of a $2\ X\ 2$ matrix • distinguish between singular and non-singular matrices • use the fact that the determinant of a singular matrix is zero to find the unknown in a $2\ X\ 2$ matrix • solve problems that involve singular and non-singular matrices	• Determinants of matrices • Singular and non-singular matrices	• Calculating the determinant of $2\ X\ 2$ matrices • Using the fact that the determinant of a singular matrix is zero to find the unknown in a 2x 2 matrix • solving problems that involve singular and non-singular matrices	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Inverse matrix	• find the inverse of a $2\ X\ 2$ non -singular matrix • solve simultaneous equations using the matrix method	• Inverse of a matrix • Simultaneous linear equations in 2 variables	• Calculating the inverse of a $2\ X\ 2$ non-singular matrix • Solving simultaneous equations using the matrix method	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.3.13 Transformation

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Translation	• translate plane figures on Cartesian Plane using translation vectors • describe fully the translations between given objects and images	• Translation vectors to move a plane figure on a cartesian plane	• Drawing of plane shapes on the Cartesian Plane • Moving plane figures/shapes using translation vectors • Describing fully the translations between given objects and images	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Reflection	• reflect plane figures in a line of reflection • find the axis of reflection of given objects and images	• Reflection of plane figures on a cartesian plane in the x-axis, y-axis, lines of the form y=a and x=b	• Drawing images of plane figures under reflection • Finding coordinates of images of plane figures under reflection • Determining the axis of reflection	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Rotation	• rotate points and plane figures on a Cartesian plane using geometric methods • find the centre of rotation • determine the angle of rotation	• Rotation of plane figures on the Cartesian plane using the geometric methods	• Discussing rotation of plane figures and points on the Cartesian plane • Rotating figures to find images on the Cartesian plane • Finding the centre and angle of rotation	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Enlargement	• enlarge plane figures about the origin using a rational scale geometrical methods • find the scale factor	• Enlargement about the origin using a rational scale by geometric methods	• Drawing images of plane figures • Determining the scale factor (enlargement factor)	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.3.13 Transformation Contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
	• determine the centre of enlargement		• determining the centre of enlargement	

8.3 .14 Probability

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Probability	• describe experimental and theoretical probability • deduce probabilities from results of experiments • identify situations where experimental and theoretical probabilities are applied • use probability rules to compute probabilities of single events • solve problems that involve experimental and theoretic probability in life	• Experimental probability • Theoretical probability • Single events	• Discussing theoretical and experimental probability • Carrying out probability experiments • Computing probabilities of single events • Solving problems that involve experimental and theoretic probability in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books software

8.4 FORM FOUR (4)

8.4.1 Financial Mathematics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Consumer arithmetic	• interpret data in the form of documents such as rates, taxes, customs and excise duty • convert from one currency to another using rate • solve problems related to sales tax, income tax , customs and excise duty and Value Added Tax (VAT)	• Foreign exchange • Sales and income tax rates (Pay as you Earn) PAYE • Value Added Tax (VAT) • Customs and Excise Duty	• Discussing foreign exchange and types of taxes • Interpreting data in the form of documents such as rates, taxes, customs and excise duty • solve problems related to sales tax, income tax , customs and excise duty and Value Added Tax (VAT) • conducting educational tours	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.2 Measures And Mensuration

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Functional graphs	• draw cubic and inverse graphs • solve problems involving cubic and inverse functions	• Cubic graphs • Inverse graphs	• Discussing cubic and inverse functions • Drawing cubic graphs • Drawing graphs of inverse functions of the form $\frac{a}{bx+c}$ where $a, b \text{ and } c$ are integers • Solving problems involving cubic or inverse functions	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Travel graphs	• explain the relationship of displacement, velocity, acceleration and time • draw displacement-time graphs • draw velocity-time graphs • solve problems involving displacement-time and velocity-time graphs	• Displacement-time graphs • Velocity-time graphs	• Discussing displacement velocity,acceleration and time • Drawing displacement-time graphs • Drawing velocity-time graphs • Solving problems involving displacement-time and velocity-time graphs	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4 3 Graphs

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Functional graphs	• draw cubic and inverse graphs • solve problems involving cubic and inverse functions	• Cubic graphs • Inverse graphs	• Discussing cubic and inverse functions • Drawing cubic graphs • Drawing graphs of inverse functions of the form $\frac{a}{bx+c}$ where $a, b \text{ and } c$ are integers • Solving problems involving cubic or inverse functions	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Travel graphs	• explain the relationship of displacement, velocity, acceleration and time • draw displacement-time graphs • draw velocity-time graphs • solve problems involving displacement-time and velocity-time graphs	• Displacement-time graphs • Velocity-time graphs	• Discussing displacement velocity,acceleration and time • Drawing displacement-time graphs • Drawing velocity-time graphs • Solving problems involving displacement-time and velocity-time graphs	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.4 Variation

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Variation	• determine connecting formulae for joint variation and partial variation • calculate unknown variables using the appropriate formula • construct graphs to show relationship between variables • solve problems involving joint and partial variation	• Joint variation • Partial variation	• Discussing joint and partial variations • Computing unknown variables using the appropriate formula • Sketching variation graphs • Solving problems in life situations involving joint and partial variation	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.5 Algebra

SUB TOPIC	LEARNING OBJECTIVES **Learners should be able to**:	CONTENT **(Attitudes, Skills and Knowledge)**	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Algebraic Manipulation	• simplify algebraic fractions • factorise quadratic expression • complete the square	• Algebraic fractions • Quadratic expressions • Factorisation • Completing the square	• Simplifying algebraic fractions using LCM of denominators and factorisation • Factorising quadratic expressions completely • complete the square	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Equations	• solve quadratic equations by completing the square • derive the quadratic formula • solve problems by applying the quadratic formula	• Completing the square • Quadratic formula	• Solving quadratic equations by completing the square • Deriving the quadratic formula by completing the square • Solving problems using quadratic formula. • Solving problems from life situations using the quadratic formula	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books / software
Inequalities	• express a given life situation using inequality symbols • represent inequalities on the Cartesian plane • solve life problems using inequalities	• Linear programming	• Discussing formulation of inequalities from given life situations • Deducing inequalities represented on the Cartesian plane • Representing inequalities on a Cartesian plane • Solving problems using inequalities	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.5 Algebra Contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
			• Representing life phenomena using mathematical model involving inequalities and exploring its application in life	

8.4.6 Geometry

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Polygons and Circle	• apply the circle theorem associated with centre,circumference,diameter, tangent, cyclic quadrilateral, chord and alternate segments • calculate angles using circle theorems	• Circle theorems	• Applying the circle theorem associated with centre,circumference,diameter, tangent, cyclic quadrilateral, chord and alternate segment. • Calculating angles using circle theorem	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Constructions	• define locus • construct locus of points in a plane which are equidistant from a fixed point, a fixed straight line, two fixed points and/or two intersecting lines • solve problems involving bearing, scale, angles of elevation and or depression using loci	• construction of diagrams to a given scale • Loci	• Discussing locus • Constructing locus of points in a plane which are equidistant from a fixed point, a fixed straight line, two fixed points and or two intersecting lines • solving problems involving bearing, scale, angles of elevation and/or depression using loci	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.7 Statistics

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Data representation	• construct frequency tables • draw frequency polygons • draw cumulative frequency curves • solve problems involving the cumulative frequency curve	• frequency table • frequency polygon • Cumulative frequency table • Cumulative frequency curve	• Constructing frequency tables • Drawing frequency polygons • Drawing the cumulative frequency curves • Solving problems involving the cumulative frequency curve	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Measures of central tendency and dispersion	• find the median from cumulative frequency curve • calculate the range • find the quartiles from cumulative frequency curve (ogive) • calculate the: - interquartile range - semi inter-quartile range	• median • Range • Quartiles • Interquartile range • Semi inter-quartile range	• Determining the median from the cumulative frequency curve (ogive) • Calculating the range • Estimating the quartiles from cumulative frequency curve • Computing the inter-quartile range and semi inter-quartile range • Discussing the importance of interquartile and semi inter-quartile range	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.8 Trigonometry

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Trigonometrical ratios	• apply the sine rule to solve problems • apply cosine rule to solve problems • use the formula area= $\frac{1}{2}$ab SinC to calculate the area of a triangle • solve triangles using sine and cosine rule • Solve 3 dimensional problems using the sine and cosine rule	• Cosine rule • Sine rule • Area of triangles	• Applying the sine and cosine rule to solve problems • Using the formula area= $\frac{1}{2}$ab SinC to calculate the area of a triangle • Using the sine rule and cosine rule to solve triangles • Solving 3 dimensional problems using the sine and cosine rule	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.9 Vectors

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Operations	• express edges and diagonals of plane shapes as linear combination of vectors • find numerical values of scalars in equal vectors • determine ratio of parallel edges/diagonals of plane shapes	• Vector properties of plane shapes	• Sketching of plane shapes • Representing edges and diagonals of plane shapes as linear combination of vectors • Calculating numerical values of scalars using equal vectors • Computing ratio of parallel edges/diagonals of plane shapes	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.10 Transformation

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Reflection	• reflect plane figures in any line of the form $y = mx + c$ • determine matrices for the reflection in $x\ and\ y - axes: y = x, y = -x$	• Reflection of plane figures in any line and using matrices	• Drawing images of objects • Determining the axes of reflection • Calculating coordinates of images • Representing life phenomena using mathematical model involving reflection of plane figures and exploring its application in life	• Relevant texts • ICT tools • Geo-boards • Environment • Braille materials and equipment • Talking books/ software
Rotation	• rotate plane shapes by drawing • rotate plane shapes using matrices • find matrices of rotations about the origin through angles which are multiples of $90°$ • describe fully the rotation given: - a matrix - object and its image	• Rotation of plane figures by drawing and use of matrices	• Calculating coordinates of images using matrices • Drawing images of plane shapes • Determining the matrices of rotations • describing fully the rotation given the matrix, object and its image	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Enlargement	• enlarge plane figures using matrices about the origin	• Enlargement using matrices about the origin • Enlargement about any point using a rational scale	• Calculating coordinates of images using matrices	• Relevant texts • ICT tools • Environment

8.4.10 Transformation Contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
	• enlarge plane figures about any point using a rational scale by drawing • describe fully an enlargement for a: - stated matrix - object and its image		• Drawing images of plane figures on the Cartesian plane • describing fully the enlargement for a given: - Matrix - Object and its image	• Braille materials and equipment • Talking books/ software
Stretch	• Define stretch • Draw images of plane shapes using geometrical methods • calculate coordinates of the image given the matrices • draw images of plane figures given matrices • identify invariant line/point • describe fully a stretch given a - matrix - object and its image	• One way and two way stretch using geometrical methods and matrices	• Discussing a stretch • Drawing images of plane shape using geometrical methods • Computing coordinates of images given the matrices • Plotting images of plane figures given matrices • Identifying invariant line/point • describing a stretch fully given a matrix or object and its image	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software
Shear	• define shear • Draw images of plane shape using geometrical methods • compute coordinates of the images given a matrix • draw images of plane figures given the matrix	• Shear using geometrical methods and matrices	• Discussing a shear • Drawing images of plane shape using geometrical methods • Calculating coordinates of image given the matrix • Plotting images of plane figures given matrices	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

8.4.10 Transformation Contd..

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
	• describe completely the shear given a - matrix - object and its image		• describing fully a shear given a matrix or an object and its image	

8.4.11 Probability

SUB TOPIC	LEARNING OBJECTIVES Learners should be able to:	CONTENT (Attitudes, Skills and Knowledge)	SUGGESTED NOTES AND ACTIVITIES	SUGGESTED RESOURCES
Combined Events	• define combined events • construct outcome tables • construct tree diagram • apply probability rules in the computation of probabilities • demonstrate the application of probability in life	• Combined events • Outcome tables • Tree diagrams • Probability rules • Application of probability	• Discussing combined events • Constructing outcome tables and tree diagrams • Computing probabilities using probability rules • demonstrating the application of probability in life • Representing life phenomena using mathematical models involving combined probability events and exploring its application in life	• Relevant texts • ICT tools • Environment • Braille materials and equipment • Talking books/ software

9.0 ASSESSMENT

9.1 Assessment Objectives

Learners will be assessed on their ability to:-

- recognise and apply mathematical symbols, terms and definitions
- carry out calculations accurately
- use a suitable degree of accuracy in approximation and measurement
- measure to a suitable degree of accuracy
- draw tables, graphs, charts and diagrams accurately
- interpret tables, graphs, charts and diagrams accurately
- apply mathematical reasoning and communicate mathematical ideas clearly
- carry out geometrical constructions and manipulations accurately
- deduce and draw inferences through manipulation of statistical data
- solve routine and non-routine problems using appropriate formulae, algorithms and procedures
- conduct research projects including those related to enterprise
- make effective use of a varietyof ICT tools in solving problems

9.2 Scheme of Assessment

Forms 1-4 Mathematics assessment will be based on 30% continuous assessment and 70% summative assessment.

The syllabus' scheme of assessment is grounded in the principle of equalisation of opportunities hence, does not condone direct or indirect discrimination of learners. Arrangements, accommodations and modifications must be visible in both continuous and summative assessments to enable candidates with special needs to access assessments and receive accurate performance measurement of their abilities. Access arrangements must neither give these candidates an undue advantage over others nor compromise the standards being assessed.
Candidates who are unable to access the assessments of any component or part of component due to disability (transitory or permanent) may be eligible to receive an award based on the assessment they would have taken.
NB For further details on arrangements, accommodations and modifications refer to the assessment procedure booklet.

9.2 (a) Continuous Assessment

Continuous assessment for Forms 1 – 4 will consists of topic tasks, written tests, end of term examinations, project and profiling to measure soft skills

- Topic Tasks

These are activities that teachers use in their day to day teaching. They should include practical activities, assignments and group work activities.

- Written Tests

These are tests set by the teacher to assess the concepts covered during a given period of up to a month. The tests should consists of short structured questions as well as long structured questions.

- End of term examinations

These are comprehensive tests of the whole term's or year's work. They can be set at school, district or provincial level.

- Project

The project would be cumulative in nature and done as one project from forms 1-2 and another one from forms 3-4

Level	Assessment task	Frequency	Weighting
Form 1	Topic tasks Written tests End of term tests	1 per term 2 per term 1 per term	4,5%
Form 2	Topic tasks Written tests End of term tests	1 per term 2 per term 1 per term	4,5%
Form 3	Topic tasks Written tests End of term tests	1 per term 2 per term 1 per term	4,5%
Form 4	Topic tasks Written tests End of term tests	1 per term 2 per term 1 per term	4,5%
Project	1 covering Forms 1 - 2 and 1 covering Forms 3-4		
Total			30%

9.2 (b) Summative Assessment

The Summative assessment consists of two papers of equal weighting

Description of the papers
Paper 1
Duration: 2 hours 30 minutes
The paper consists of about 30 short structured questions marked out of 100 and is compulsory, set covering all syllabus topics.

Paper 2
Duration: 2 hours 30 minutes
The paper consists of two sections, Section A and Section B and it will be set covering all topics of the syllabus.

Section A: Consists of five (5) compulsory questions marked out of 52

Section B: Consists of seven (7) long questions. The candidates are expected to answer 4 questions of their choice. Each question carries twelve (12) marks and the section is marked out of 48

Description table

Paper	Paper type	Marks	Duration	Weighting
1	Structured – short answer questions	100	2 1/2 hours	35%
2	Structured– short and long answer questions	100	2 1/2 hours	35%
Total				70%

9.3 Specification Grid

Skill	Paper 1	Paper 2
Knowledge and comprehension	50%	35%
Application and Analysis	40%	45%
Problem solving	10%	20%
TOTAL	100%	100%

ASSESSMENT MODEL