ST. MAARTEN ACADEMY

MATHEMATICS DEPARTMENT

FORM 5

SYLLABUS FOR
2023 - 2024

Caring, Learning, Achieving, Excelling

TABLE OF CONTENTS

FORM FIVE

GENERAL OBJECTIVES

1. To continually use problem solving language and communication – making connections within and outside mathematics while using logical, formal and informal reasoning in problem solving contexts.

2. To use symbolic reasoning to represent mathematical concepts and the relationship among them.

3. To understand that shapes and figures provide powerful ways to connect mathematical and real world situations.

4. To realise the importance of decision making as applied to mathematics and the real world.

5. To perceive functions and equations as means of analyzing and understanding a broad variety of relationships and as a general tool for expressing generalisations.

6. To use mathematical methods to model and solve real-life problems involving money and specific data.

7. To understand that spatial reasoning plays a critical role in geometry.

8. To communicate mathematical ideas using language, efficient tools, appropriate units, numerical, physical or algebraic mathematical models.

TOPICS: FORM FIVE *TERM ONE*

NOTE: Matrices from 4th form (pg. 35) is carried over to 5th form and will be covered before the following regular 5th form topics. 3 weeks

1.	Vectors	3 weeks
2.	Matrices and Transformation	2 weeks
3.	Functions	2 weeks
4.	Variations	1 week
5.	Trigonometry	3 weeks

TERM TWO

1.	Geometrical Construction	1 week
2.	Linear Programming	2 weeks
3.	Circle Theorem	2 weeks
4.	Travel Graphs	2 weeks
5.	Solutions of Quadratic Functions (part 2)	1 week
6.	Simultaneous Equations (quadratic or non linear and linear)	2 weeks

FORM FIVE *TERM ONE*

NOTE: Matrices from 4th form is to be done before these topics, for 3 weeks

WK	TOPIC	OBJECTIVES	ASSESSMENT
1	**VECTORS** Concepts Resultant Triangle law Parallelogram law	• Explain concepts associated with vectors (magnitude, direction, line segment, scalar) • Find the resultant of a vector using geometry Combine vectors using the triangular law or parallelogram law and 2 x 1 Column matrices	Class work Homework Quiz
2	Triangle law Parallelogram law Position vector	• Express a point P (a, b) as a position vector $\overrightarrow{OP} = \begin{pmatrix} a \\ b \end{pmatrix}$ where O is the origin (0,0). • Solve problems in Geometry using position vectors	Class work Homework Quiz
3	Magnitude Collinear, parallel	• Determine the magnitude of a vector • Use vectors to solve problems in Geometry (Co-linearity, parallel	Class work Homework Quiz
4	**TRANSFORMATION MATRICES** Reflection Rotation Enlargement	• Determine a 2 x 2 matrix associated with specified transformation; • Determine a 2 x 2 matrix representation of the single transformation which is equivalent to the composition of two linear transformation in a plane (where the origin remains fixed)	Class work Homework Quiz
5	Inverse Transformations	• Exercises involving the above as well as the 2 x 2 matrix for the inverse of a transformation.	Class work Homework Quiz Test

FORM FIVE *TERM ONE*

WK	TOPIC	OBJECTIVES	ASSESSMENT
6	**FUNCTIONS** Composite functions Inverse functions	• Derive composite functions • Determine that composite functions are non-commutative • State the relationship between a function and its inverse • Derive the inverse of a function (include composite function)	Class work Homework Quiz
7	Composite functions Inverse functions	• Evaluate f(a), $f^{-1}(a)$, fg(a) $(fg)^{-1}(a)$ where a is a real number • Use the relationship $(fg)^{-1} = g^{-1} f^{-1}$	Class work Homework Quiz
8	**VARIATIONS** Direct variation Indirect Variation	• Represent direct and indirect variation symbolically • Solve problems involving direct variation and inverse variation	Class work Homework Quiz Test
9	**TRIGONOMETRY** Sine rule Cosine rule	• Use the sine and cosine rules in the solution of problems involving triangles.	Class work Homework Quiz
10	Bearings Area of a triangle	• Solve problems involving bearings using sine and cosine rules • Calculate the area of a triangle using Area = ½ ab Sin C	Class work Homework Quiz
11	Three dimensional problems	• Solve practical problems involving heights and distances, in three dimensional situations.	Class work Homework Quiz Test

FORM FIVE *TERM TWO*

WK	TOPIC	OBJECTIVES	ASSESSMENT
1	**CONSTRUCTIONS** Lines Angles Regular and irregular polygons	• Construct parallel and perpendicular lines • Bisect lines • Construct angles of 30°, 45°, 60°, 90° and 120° • Bisect angles • Construct triangles, quadrilaterals, regular and irregular polygons.	
2	**LINEAR PROGRAMMING**	• Use linear programming techniques to solve problems involving two variables.	
3	**LINEAR PROGRAMMING**	• Write the inequalities for a given graphed solution set.	Class work Homework Quiz
4	**CIRCLE THEOREM**	• State and use the theorem for angle at the centre and angle at the circumference • State and use the theorem for angle in a semicircle. • State and use the theorem for angles in the same segment • State and use the theorem for opposite angles in a cyclic quadrilateral • State and use the theorem for exterior angle and interior opposite angle of cyclic quadrilateral	
5	**CIRCLE THEOREM**	• State and use the theorem for angle between tangent and radius. • State and use the theorem for angle between tangent and chord and angle in the alternate segment. • State and use the theorem for lengths of two tangents from an external point.	

FORM FIVE *TERM TWO*

WK	TOPIC	OBJECTIVES	ASSESSMENT
6	**TRAVEL GRAPHS**	• Draw and interpret distance-time graphs	Class work Homework
7	**TRAVEL GRAPHS**	• Draw and interpret speed-time graphs	Class work Homework Quiz
8	**QUADRATIC FUNCTIONS**	• Solve quadratic equations using the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	Class work Homework Quiz
9	**QUADRATIC FUNCTIONS**	• Determine the maximum or minimum value of a quadratic function and the axis of symmetry, by completing the square: form $a(x+h)^2 + k$. • Sketch graphs of quadratic functions in the form $a(x+h)^2 + k$.	
10	**QUADRATIC FUNCTIONS**	• Solve simultaneous equations in two variables (one linear and one quadratic)	Class work Homework Quiz

LIST OF TEXT BOOKS

Mathematics for Caribbean Schools,Third Edition, Bk. 1; A. Foster, T. Tomlinson

Mathematics for Caribbean Schools,Third Edition, Bk. 2; A. Foster, T. Tomlinson

Mathematics for Caribbean Schools,Third Edition, Bk. 3; A. Foster, T. Tomlinson

Mathematics for Caribbean Schools,Third Edition, Bk. 4; A. Foster, T. Tomlinson

Nelson Caribbean Mathematics, Bk. 1 ; M. Folkes, M. Maxwell

Nelson Caribbean Mathematics, Bk. 2 ; M. Folkes, M. Maxwell

Nelson Caribbean Mathematics, Bk. 3 ; M. Folkes, M. Maxwell

Oxford Mathematics for the Caribbean, Fourth Edition; N. Goldberg, C. King, C. Lutchman.

MATHEMATICS , A COMPLETE COURSE, WITH CXC QUESTIONS, Volumes 1 & 2; Raymond Toolsie

CXC Basic Mathematics, A Revision Course, Second Edition; A. Greer, C.E. Layne

CXC Mathematics For Today, Volumes 1&2; G. Buckwell, R. Solomon, T. Chung Harris