Grade Course	S1 ICA	Subject	Math
Class Hours	5 periods／Week		

Competencies

① Inquiry	Continually ask questions about mathematical matters and try to pursue the logical thinking in math.
② Problem Solving	Identify the problem and given information. Applying knowledge to solve real world problems using mathematical reasoning.
③ Creativity	Create an investigation into a mathematical model and connecting mathematical fields with the real world.

	A Recognition	B Logical Thinking	C Creative Thinking
3	•Apply knowledge and mathematical reasoning to solve a real-world problem.	•Reason mathematically. •Model with mathematics. •Investigate processes and evaluate different models.	•Create an original problem or model that benefits society. •Construct viable arguments and processes to develop, use, and evaluate investigative models.
2	•Use the given information to connect with previous understandings.	•Connect mathematical concepts. •Critique the reasoning of others. •Draw, construct and describe.	•Efficiently deconstruct problems. •Use tools strategically. •Draw informal comparative inferences.
1	•Identify the problem and given information. •Know the meaning of key vocabulary.	•Break down a problem into manageable components. •Look for structure. •Identify the logical units of a problem and their connections.	•Reason abstractly and quantitatively. •Make use of structure.

Term	Month	Unit	Unit Goals	Activities
1	4 5 6 7 8	**MATH 1 and MAM preparatory program** Chapter 12: Trigonometry Chapter 15: Non-right angled triangle trigonometry Chapter 18: Relation and functions Chapter 19: Quadratic functions Summer Homework:	● Students will use trigonometric ratios to solve unknown lengths, angles and apply it to solve problems with bearings. ● Students will use the area of a triangle in the unit circle to investigate the sine and cosine rule. ● Students will learn how to about relation and function notation and transforming y = f(x). ● Students will examine properties of quadratic function graphs and investigate into quadratic optimization.	● Investigation 1: Ratio of sides of right angled triangles. Investigation 2: Hipparchus and the universe 3 –dimensional problem solving ● Proving the cosine rule Investigation - Angle sizes Problem solving using the sine and cosine rule ● Investigation 1: Graphs of the form $y = f(x) + k$ and $y = f(x - k)$ Investigation 2: Graphs of the form $y = kf(x)$ and $y = f(kx)$ Investigation 3: Graphs of the form $y = f(x)$ and $y = f(-x)$ ● Investigation 1: Graphs of quadratic functions Investigation 2: Axes intercepts
2	9 10 11 12	Chapter 20: Exponential functions and logarithms. Chapter 22: Polynomials Chapter 23: Advanced trigonometry Chapter 24: Conic Sections Winter Homework: Plane Figures review/Space Figures introduction	● Students will learn the basic properties of exponential and logarithmic functions and examine growth and decay. ● Students will learn how to do operations with polynomials. They will explore the remainder theorem and factor theorem. ● Students will use the unit circle to understand trigonometric functions and equations. ● Students will learn properties of circles, ellipses, hyperbolae and truncus.	● Investigation 1: Graphs of the form of $f(x) = ax, a > 0, a \neq 0$ Investigation 2: Solving exponential equations graphically. Investigation 3: Logarithm laws ● Discussion about polynomial degrees Investigation – Graphs of polynomials ● Investigation – Families of trigonometric functions ● Investigation 1: Ellipses Investigation 2: The hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ Investigation 3: The family of curves $y = \frac{k}{x}, k \neq 0$

3	1	**WACE – MAM Unit 1** Topic 1.1: Functions and graphs Topic 1.2: Trigonometric functions	• Students will examine properties of function graphs and investigate. • Students learn to solve and graph trigonometric equations expressing exact values and angles in radians.	• Investigation 1: Functions and graphs • Investigation 2: Trigonometric functions
	2			
	3			