Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	1		**Exam**	End of unit assessment	
Unit Title	Quadratic and Fractional Equations				**Required Materials**
Unit Summary	Students get to understand quadratic and fractional equations, exploring diverse solving methods such as completing the square, employing formulas, and graphical techniques. They will also learn how to solve fractional equations reducible to quadratic form and gain proficiency in sketching graphs of quadratic functions. Through real-world applications, students will grasp the practical significance of quadratic equations and functions, enhancing their problem-solving abilities.				*Think! Mathematics G3 3A (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** ● Solving quadratic equations by completing the square ● Solving quadratic equations using formula ● Solving fractional equations reducible to quadratic equations ● Solving quadratic equations by graphical method ● Sketching graphs of quadratic functions ● Applications of quadratic equations and function in real-world contexts **Learning Objectives:** Students would be able to: ● Solve quadratic equations in one variable by completing the square for equations of the form $x^2 + bx + c = 0$, use of formula, and graphical method. ● Solve fractional equations that can be reduced to quadratic equations. ● Sketch the graphs of quadratic equations of varying forms. ● Formulate a quadratic equation in one variable to solve problems. ● Recognize why quadratic equations and quadratic functions have useful applications in mathematics and real-world contexts.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● PBL (Application of Quadratic equation) ● Model Completing the Square method to solve Quadratics ● Formative assessments (worksheets, practice exercises, etc.) ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	1		**Exam**	End of unit assessment	
Unit Title	Simultaneous Linear Inequalities				**Required Materials**
Unit Summary	Equip students with the skills to handle simultaneous linear inequalities, including solving them and addressing problems with these inequalities. Master effective strategies, enhance problem-solving skills, and understand practical applications for real-world scenarios.				*Think! Mathematics G3 3A (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis			
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.
	Basics	**Development**	**Judgment**

Unit Content

Key Topics Covered:

- Solving simultaneous linear inequalities
- Solving problems involving simultaneous linear inequalities

Learning Objectives:

Students would be able to:

- Solve simultaneous linear inequalities in one variable and represent the solution on a number line.
- Apply simultaneous linear inequalities to solve word problems.
- Recognize why simultaneous linear inequalities have useful applications in mathematics and real-world contexts.

Notes, Means of Assessment

- Research about George Dantzig and his contribution to Linear Programming (equations/inequalities)
- Polya's Problem Solving Model
- Formative assessments (worksheets, practice exercises, etc.)
- End of unit assessment (IXL)

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	1		**Exam**	End of unit assessment	
Unit Title	Indices and Standard Form				**Required Materials**
Unit Summary	Students will explore the concepts of indices and standard form, covering topics such as indices laws, zero and negative indices, rational indices, compound interest, and standard form notation. By delving into these topics, students will develop a deeper understanding of mathematical principles and their practical applications, enhancing their problem-solving skills and ability to work with numbers in various contexts.				*Think! Mathematics G3 3A (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** ● Indices ● Laws of indices ● Zero and negative indices ● Rational indices ● Compound interest. ● Standard form **Learning Objectives:** Students would be able to: ● Apply the five laws of indices. ● State and use the definitions of zero, negative and rational indices. ● Represent very large or very small numbers using standard form. ● Recognize why indices and standard form have useful applications in mathematics and real-life contexts.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● PBL Activity on indices and standard form ● Design a chart containing the laws of indices and standard form ● Application of indices and standard form activity ● Formative assessments (worksheets, practice exercises, etc.) ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	1	**Exam**	End of unit assessment		
Unit Title	Coordinate Geometry				**Required Materials**
Unit Summary	Equip students with the foundational knowledge of coordinate geometry, enabling them to understand key concepts such as determining the length of a line segment, calculating the gradient of a straight line, interpret and find the equation of a straight line. Through mastering these fundamentals, students will enhance their problem-solving skills and mathematical reasoning, laying a strong foundation for further exploration in coordinate geometry.				*Think! Mathematics G3 3A (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				**Unit Content**
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** ● Length of a line segment ● Gradient of a straight line ● Equation of a straight line **Learning Objectives:** Students would be able to: ● Find the length of a line segment given the coordinates of its endpoints. ● Find the gradient of a straight line given the coordinates of two points on it. ● Interpret and find the equation of a straight line graph in the form $y = mx + c$. ● Solve geometry problems involving the use of coordinates.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● Research the invention of the Cartesian coordinate system by Rene Descartes ● Application of Coordinate Geometry activity ● Formative assessments (worksheets, practice exercises, etc.) ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	2		**Exam**	End of unit assessment	
Unit Title	Graphs of Functions and Graphical Solution				**Required Materials**
Unit Summary	Students will explore various function graphs, including cubic, reciprocal, and exponential functions. They'll understand the shapes and features of these graphs and learn about concepts like gradient of curves. Real-world applications will highlight the practical use of function graphs, enhancing problem-solving skills and mathematical understanding.				*Think! Mathematics G3 3A (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** ● Graphs of cubic functions ● Graphs of reciprocal functions ● Graphs of exponential functions ● Gradient of a curve ● Applications of graphs in real-world contexts. **Learning Objectives:** Students would be able to: ● Draw the graphs of simple sums of power functions $y = ax^n$, where $n = 3, 2, 1, 0, -1$ and -2. ● Draw the graphs of exponential functions $y = ka^x$, where a is a positive integer and $a \neq 1$ ● Estimate the gradient of a curve by drawing a tangent. ● Interpret and analyze data from tables and graphs, including distance-time and speed-time graphs.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● PBL Activity on Graphs of Functions and Graphical Solution ● Investigate Graphs of Functions ● Application of graphs in real-world contexts activity ● Formative assessments (worksheets, practice exercises, etc.) ● End of unit assessment (IXL) ● Cumulative Final Exam (paper)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	2		**Exam**	End of unit assessment	
Unit Title	Trigonometric Ratios				**Required Materials**
Unit Summary	Students will delve into trigonometric ratios, understanding their significance and applications in solving problems related to right-angled triangles. They'll learn how to use trigonometric ratios to find unknown sides and angles in right-angled triangles, honing their problem-solving skills in geometry. Additionally, they'll explore real-world applications of trigonometric ratios, gaining insight into how these mathematical concepts are utilized in practical scenarios.				*Think! Mathematics G3 2B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis			
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.
	Basics	**Development**	**Judgment**

Unit Content

Key Topics Covered:

- Trigonometric ratios
- Applications of trigonometric ratios to find unknown sides of right-angled triangles.
- Applications of trigonometric ratios to find unknown angles in right-angled triangles.
- Applications of trigonometric ratios in real world contexts

Learning Objectives:

- Understand what the trigonometric ratios of acute angles are.
- Find the unknown sides in right-angled triangles using trigonometric ratios.
- Find the unknown angles in right-angled triangles using trigonometric ratios.
- Apply trigonometry in real-world contexts.

Notes, Means of Assessment

- “What is the height?” project
- Formative assessments (worksheets, practice exercises, group activity, etc.)
- End of unit assessment (IXL)

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	2		**Exam**	End of unit assessment (IXL)	
Unit Title	Further Trigonometry				**Required Materials**
Unit Summary	Students will deepen their understanding of trigonometry through exploring topics like finding the sine and cosine of obtuse angles, calculating the area of triangles, and applying the sine and cosine rules. Through practical examples and applications, they'll develop proficiency in using trigonometric principles to solve geometric problems, enhancing problem-solving skills and geometric reasoning along the way.				*Think! Mathematics G3 3B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				**Unit Content**
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	**Key Topics Covered:** ● Sine and cosine of obtuse angles ● Area of triangle ● Sine rule ● Cosine rule **Learning Objectives:** ● Understand the relationship between trigonometric ratios of acute angles and obtuse angles. ● Find the area of a triangle. ● Find the unknown sides and angles of a triangle using Sine Rule, when given two angles and one side, or two sides and one non-included angle. ● Find the unknown sides and angles of a triangle using Cosine Rule, when given two sides and one included angle, or three sides. ● Recognize why trigonometry has useful real-life applications
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● Trigonometry Application Project ● Discussion and investigation about trigonometric properties ● Formative assessments (worksheets, practice exercises, etc.) ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	2		**Exam**	End of unit assessment	
Unit Title	Applications of Trigonometry				**Required Materials**
Unit Summary	Students will explore the practical applications of trigonometry, delving into angles of elevation and depression, bearings, and three-dimensional problems. Through real-world scenarios and applications, they'll see how trigonometric principles come to life, helping to solve problems involving heights, directions, and spatial relationships.				*Think! Mathematics G3 3B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	**Key Topics Covered:** ● Angles of elevation and depression ● Bearings ● Three-dimensional problems **Learning Objectives:** ● Solve problems in two dimensions involving angles of elevation and depression. ● Understand what bearings are and solve problems in two dimensions involving bearings. ● Solve problems in three dimensions including those involving angles of elevation and depression, and bearings. ● Recognize why trigonometry has useful real-life applications.
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● Trigonometry model project ● Formative assessments (worksheets, practice exercises, group activity, etc.) ● Discussion and investigation about trigonometric properties ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	2		**Exam**	End of unit assessment	
Unit Title	Arc Length, Sector Area, and Radian Measure				**Required Materials**
Unit Summary	Students will explore arc length, sector area, and radian measure, investigating topics such as determining the length of an arc, finding the area of a sector, and understanding radian measure. They'll also learn how to calculate arc length and sector area using radian measure. Through practical examples and exercises, students will deepen their understanding of these concepts and their relevance in geometry and trigonometry.				*Think! Mathematics G3 3B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** ● Length of arc ● Area of sector ● Radian measure ● Arc length and sector area using radian measure. **Learning Objectives:** ● Find the length of an arc when given an angle in degrees. ● Find the area of a sector and the area of a segment of circle when given an angle in degrees. ● Understand what radian measure is and convert an angle in radians to degrees and vice versa. ● Find the length of an arc, the area of a sector and the area of a segment of circle when given an angle in radians.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● Application of arc and sector dimensions to design structures ● Formative assessments (worksheets, practice exercises, group activity, etc.) ● Discussion and investigation about arc, sector, and radian measure ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	3		**Exam**	End of unit assessment	
Unit Title	Congruence and Similarity Tests				**Required Materials**
Unit Summary	Students will explore congruence and test the concept of similarity, covering topics such as bisectors and scale drawings, congruence tests, and similarity tests. They'll learn how to apply these tests to determine whether triangles are congruent or similar. By engaging with a variety of problems and scenarios, students will deepen their understanding of these concepts and explore how congruent and similar triangles are used in various real-world contexts.				*Think! Mathematics G3 3B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 • I can identify patterns, make generalizations, and connect mathematical concepts across different topics. • I can develop and justify efficient strategies to solve complex, multi-step problems. • I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 • I can compare and present multiple methods for solving problems and justify my choices. • I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. • I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 • I can design and pose mathematical problems or challenges related to studied concepts. • I can formulate and test conjectures by exploring relationships between variables. • I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** • Bisectors and scale drawings • Congruence tests • Similarity tests • Applications of congruent and similar triangles. **Learning Objectives:** • Construct perpendicular bisectors and angle bisectors. • Apply the properties of perpendicular bisectors and angle bisectors. • Construct scale drawings. • Determine whether two or more triangles are congruent. • Determine whether two or more triangles are similar. • Apply properties of congruent and similar triangles to solve real-world problems.
Application **Level 2: Critical Thought**	A2 • I can analyze mathematical structures, properties, and relationships to apply them in different contexts. • I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. • I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 • I can interpret and clearly explain the steps in my problem-solving process. • I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. • I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 • I can identify and explore patterns in mathematical problems and real-world applications. • I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. • I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 • I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. • I can perform fundamental calculations and procedures. • I can apply mathematical formulae and strategies to solve problems.	B1 • I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. • I can describe the steps I take to solve problems and explain my reasoning clearly. • I can reflect on my mistakes and adjust my approach when solving problems. • I can communicate mathematical solutions using correct mathematical language.	C1 • I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. • I can follow structured procedures to investigate mathematical ideas and solve problems. • I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** • Estimation project and deductions • Formative assessments (worksheets, practice exercises, group activity, etc.) • Application of similarity and congruence project • End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	3		**Exam**	End of unit assessment	
Unit Title	Area and Volume of Similar Figures and Solids				**Required Materials**
Unit Summary	Students will explore the area and volume of similar figures and solids, covering topics such as finding the area of similar figures, calculating the volume of similar solids, and solving problems involving these shapes. They'll learn how to apply geometric principles to determine the area and volume of similar objects, enhancing their understanding of spatial relationships and geometric properties. Through problem-solving activities students will deepen their comprehension of these concepts and their relevance in various contexts.				*Think! Mathematics G3 3B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	**Key Topics Covered:** ● Area of similar figures ● Volume of similar solids ● Solving problems involving similar solids **Learning Objectives:** ● Compare ratios between the lengths, areas and volumes of similar figures and solids. ● Recognize how a change in scale factor affects the area and volume of similar figures and solids. ● Solve real-world problems using the relationship between similar figures and solids.
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● Model design of a solid shape ● Formative assessments (worksheets, practice exercises, etc.) ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	

Salesian International School 2024-2025 Module Rubric					
Year	9	**Course**	AG Mathematics	**Credits**	5
Term	3		**Exam**	End of unit assessment	
Unit Title	Geometrical Properties of Circles				**Required Materials**
Unit Summary	Students will delve into the geometrical properties of circles, including their symmetric properties and angle properties. They'll explore how circles exhibit symmetry and how various angles are formed within them. By engaging with a variety of problems and scenarios, students will deepen their understanding of these properties and their applications in geometry.				*Think! Mathematics G3 3B (8th Ed.)* (Textbook and Workbook) Notebook, writing utensil, iPad, internet access.

Assessment Basis				Unit Content
	Knowledge Fundamentals	**Application Communication**	**Inquiry Creativity**	**Key Topics Covered:** ● Symmetric properties of circles ● Angle properties of circles **Learning Objectives:** ● Identify symmetric and angle properties of circles. ● Apply symmetric and angle properties of circles to solve problems.
Research **Level 3: Creative Thought**	A3 ● I can identify patterns, make generalizations, and connect mathematical concepts across different topics. ● I can develop and justify efficient strategies to solve complex, multi-step problems. ● I can apply mathematics in unfamiliar contexts and create models to represent real-world situations.	B3 ● I can compare and present multiple methods for solving problems and justify my choices. ● I can collaborate with others to refine and explain mathematical reasoning, including different problem-solving approaches. ● I can effectively use mathematical representations and visuals (graphs, equations, diagrams, technology) to communicate reasoning and solutions.	C3 ● I can design and pose mathematical problems or challenges related to studied concepts. ● I can formulate and test conjectures by exploring relationships between variables. ● I can solve complex and non-routine mathematical problems, requiring deep reasoning, abstraction, or original problem-solving strategies.These problems represent the highest level of challenge in assessments.	
Application **Level 2: Critical Thought**	A2 ● I can analyze mathematical structures, properties, and relationships to apply them in different contexts. ● I can use appropriate mathematical techniques, formulas, and reasoning to solve problems accurately. ● I can apply mathematical formulae and strategies to solve intermediate multi-step problems.	B2 ● I can interpret and clearly explain the steps in my problem-solving process. ● I can justify my calculations, solutions, and conclusions using logical reasoning and appropriate mathematical language. ● I can construct arguments and, where appropriate, use proof or counterexamples to support my reasoning and application of concepts and procedures.	C2 ● I can identify and explore patterns in mathematical problems and real-world applications. ● I can apply mathematical concepts to solve practical problems, including interdisciplinary connections. ● I can analyze data and relationships between variables to make predictions and draw conclusions.	
Foundation **Level 1: Logical Thought**	A1 ● I can recognize and use basic mathematical concepts, symbols, and operations relevant to the topic. ● I can perform fundamental calculations and procedures. ● I can apply mathematical formulae and strategies to solve problems.	B1 ● I can use correct notation and symbols to represent mathematical expressions, equations, and relationships. ● I can describe the steps I take to solve problems and explain my reasoning clearly. ● I can reflect on my mistakes and adjust my approach when solving problems. ● I can communicate mathematical solutions using correct mathematical language.	C1 ● I can ask relevant questions to clarify and deepen my understanding of mathematical concepts. ● I can follow structured procedures to investigate mathematical ideas and solve problems. ● I can use mathematical tools (e.g., diagrams, graphs, equations, technology) to explore and validate concepts.	**Notes, Means of Assessment** ● Investigation of the geometric properties of a circle activity ● Formative assessments (worksheets, practice exercises, group activity, etc.) ● Application of the geometric property of a circle project ● End of unit assessment (IXL)
	Basics	**Development**	**Judgment**	