Content Standards

Content Standard 1 - Number Sense and Operations

A student, applying reasoning and problem solving, will use number sense and operations to represent numbers in multiple ways, understand relationships among numbers and number systems, make reasonable estimates and compute fluently within a variety of relevant cultural contexts.

Content Standard 2 - Data Analysis

A student, applying reasoning and problem solving, will use data representation and analysis, probability, statistics and statistical methods to evaluate information and make informed decisions within a variety of relevant cultural contexts.

Content Standard 3 - Geometric Reasoning

A student, applying reasoning and problem solving, will understand geometric properties and spatial relationships, transformation of shapes, representational systems, spatial reasoning and geometric models to analyze mathematical situations within a variety of relevant cultural contexts.

Content Standard 4 - Algebraic Reasoning

A student, applying reasoning and problem solving, will use algebraic and functional concepts and procedures to understand patterns, quantitative and functional relationships, algebraic representations, models and change within a variety of relevant cultural contexts.

Content Standard 1 -	Number Sense and Operations						
	A student, applying reasoning and problem solving, will use number sense and operations to represent numbers in multiple ways, understand relationships among						
	numbers and number systems, make reasonable estimates and compute fluently within a variety of relevant cultural contexts.						
State Established Benchmark	Essential Learning Expectation (ELE) /		NCTM Standard		Assessment Statements	Vocabulary	
At the end of Grade 12, a proficient	HPS Critical (Competencies)				(Specific Examples)	(for instructional purposes)	
Student will:							
1.1 (Magnitude): Represent very large and very	Implicit in all the standards below is the process standard specifying that all						
small numbers using multiple notations and	topics are taught with multiple representations through problem solving with appropriate technology						
interpret their effects in problem situations.	арргорнае теснногоду						
1.2 Estimation : Identify situations where estimation	Algebra Topics 1.4 1.5	•	Geometry	•	Polar Coordinates-graph, convert between		
is appropriate and determine the needed		•	Algebra		polar/rectangular coordinates, polar form of complex		
degree of precision and accuracy. 1.3 Equivalence: Given a representation of a		•	Number and Operations		number, polar form of a linear equation		
1.3 Equivalence: Given a representation of a number or expression, find equivalent							
representations using multiple notations (e.g.,							
exponents and roots).							
1.4 Properties: Analyze and apply the properties of	Logarithms and Exponents 1.3 1.4 1.5	•	Algebra	•	Logarithmic and Exponential Functions-graph, solve		
numbers and number systems.	Logarithms and Exponents 1.5 1.4 1.5	•	Number and Operations		equations, applications such as time value of money, dB,		
1.5 Modeling : Identify givens and unknowns in an					and earthquakes		
unfamiliar situation and describe relationships							
between variables (e.g., the effect of changing an interest rate on monthly payments).							
an interest rate on monthly payments).							

^{**}Math IV does not cover all 4 standards, therefore only Standards 1, 3, and 4 are reflected in this document.

Content Standard 3 -	Geometric Reasoning A student, applying reasoning and problem solving, will understand geometric properties and spatial relationships, transformation of shapes, representational systems, spatial reasoning and geometric models to analyze mathematical situations within a variety of relevant cultural contexts.						
State Established Benchmark At the end of Grade 12, a proficient Student will:	Essential Learning Expectation (ELE) / HPS Critical (Competencies)	NCTM Standard	Assessment Statements (Specific Examples)	Vocabulary (for instructional purposes)			
 3.1 Reasoning: Use inductive and deductive reasoning to verify conjectures about relationships (e.g., congruence) between two-and three-dimensional objects. 3.2 Transformations: Apply transformations on figures (e.g. dilations, rotations, translations, reflections) to solve problems, and interpret the results of composite transformations. 3.3 Triangle Relationships: Solve problems using triangles, including special triangles (e.g., 30-6-0-90) and properties of triangles (e.g. sine, cosine, tangent). 3.4 Methods of Proof: Make, test, and validate conjectures using a variety of techniques (e.g., counterexample, indirect proof). 3.5 Applications: Use spatial reasoning and geometric models to solve real world problems involving regular and irregular shapes. 	Implicit in all the standards below is the process standard specifying that all topics are taught with multiple representations through problem solving with appropriate technology Trigonometry 3.3 3.4 3.5	• Geometry	 Unit Circle and special angle trigonometric values (0, 30, 45, 60 & 90 degrees) Law of Cosines and Sines (including ambiguous case) with applications Graphing trig. Functions (sine or cosine) Modeling harmonic functions Verifying and using trig. Identities Solve trig. Equations Polar Coordinates-graph, convert between polar/rectangular coordinates, polar form of complex number Vectors-resultant (geometric and algebraic), polar/rectangular form, applications 				

Content Standard 4 -	Algebraic Reasoning A student, applying reasoning and problem solving, will use algebraic and functional concepts and procedures to understand patterns, quantitative and functional relationships, algebraic representations, models and change within a variety of relevant cultural contexts.						
State Established Benchmark At the end of Grade 12, a proficient Student will:	Essential Learning Expectation (ELE) / HPS Critical (Competencies)	NCTM Standard	Assessment Statements (Specific Examples)	Vocabulary (for instructional purposes)			
 4.1 Symbols: Choose appropriate variables to construct expressions and equations representing given problem situations (e.g., linear, quadratic, exponential). 4.2 Solving: Solve a variety of equations, inequalities and their systems; justify the solution process using properties of numbers; and interpret solutions in context. 4.3 Functions: Represent functions in a variety of ways including tabular, graphic, symbolic, and verbal, and select an appropriate form for solving a given problem. 4.4 Transforming Functions: Analyze the effects of transformations on families of functions, recognize their characteristics, and represent functions in equivalent forms. 4.5 Modeling: Given data or a problem situation, select and use an appropriate function model to analyze results or make a prediction 4.6 Connections with Geometry: Represent 	Implicit in all the standards below is the process standard specifying that all topics are taught with multiple representations through problem solving with appropriate technology. Functions 4.3 4.4 4.5 Matrices 4.2 Discrete Math 4.2 4.5	Algebra Number and Operations Algebra Algebra	Factor and solve polynomial equations of various degrees, including those with complex roots-including polynomial long division and synthetic division. Logarithmic and Exponential Functions-graph, solve equations, applications such as time, value of money, decibels, and earthquakes. Determine composition and inverses of functions (where the inverse exists) Graphing trigonometry functions Modeling harmonic functions Parametric Equations – modeling motion Calculate determinants and multiplicative inverses Solving 2-Dimensional and 3-dimensional systems including Reduced Row Echelon Form. Arithmetic and Geometric Sequences and Series-recursive				
geometric problems algebraically and algebraic situation geometrically.		- ragonia	and explicit form equations, finding nth term, infinite sequences and series, special sequences and series.				