

Big Understandings of the Content Area

- ♦ Recognize and use a wide variety of functions.
- ♦ Understand and use trigonometry in triangles and as periodic phenomena
- ♦ Understand concepts of limits as an introduction to Calculus.

Content Standards

A. NUMBERS AND NUMBER SENSE: Students will understand and demonstrate a sense of what numbers mean and how they are used.

B. COMPUTATION: Students will understand and demonstrate computation skills.

D. PROBABILITY: Students will understand and apply concepts of probability.

E. GEOMETRY: Students will understand and apply concepts from geometry.

F. MEASUREMENT: Students will understand and demonstrate measurement skills.

Performance Indicators

Students will be able to:

- ♦ Describe the structure of the real number system and identify its appropriate applications and limitations.
- ♦ Explain what complex numbers (real and imaginary) mean and describe some of their many uses.
- ♦ Understand basic definitions of exponents and roots.

Performance Indicators

Students will be able to:

- ♦ Use various techniques to approximate solutions, determine the reasonableness of answers, and justify the results.
- ♦ Demonstrate computation skills with Real Numbers.
- ♦ Understand and apply laws of exponents.
- ♦ Understand and apply rules for operations on roots.

Performance Indicators

Students will be able to:

- ♦ Find the probability of compound events and make predictions by applying probability theory.
- ♦ Create and interpret probability distributions.
- ♦ Use counting techniques

Performance Indicators

Students will be able to:

- ♦ Draw coordinate representations of geometric figures and their transformations.
- ♦ Apply trigonometry to problem situations involving triangles and periodic phenomena.
- ♦ Understand the Pythagorean Theorem and use it to solve problems.
- ♦ Use geometric models to solve problems in two or three dimensions.
- ♦ Perform transformations (translations, rotations, dilations) on geometric shapes.

Performance Indicators

Students will be able to:

- ♦ Use measurement tools and units appropriately and recognize limitations in the precision of the measurement tools.
- ♦ Derive and use formulas for area, surface area, and volume of many types of figures.
- ♦ Understand and use formulas for distance between points in a coordinate system.

Knowledge/Skills

- ♦ Write complex numbers in polar form and find products in polar form.
- ♦ Use DeMoivre's Theorem to find powers of complex numbers.
- ♦ Find roots of complex numbers.

- ♦ Apply laws of exponents with Real Numbers.
- ♦ Use logarithmic rules.
- ♦ Find the sum of the first n terms of arithmetic or geometric series.

- ♦ Use Venn Diagrams to illustrate union and intersection of sets.
- ♦ Use Fundamental Counting Principle to solve problems.
- ♦ Solve problems involving permutations and combinations.
- ♦ Use the Binomial Theorem

- ♦ Use trigonometry to solve right triangles.
- ♦ Use trigonometry to find the area of a triangle.
- ♦ Use the Law of Sines.
- ♦ Use the Law of Cosines.
- ♦ Solve navigation and surveying problems using trigonometry.

- ♦ Find the measure of an angle in degrees or radians.
- ♦ Find arc length and area of a sector of a circle.

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<ul style="list-style-type: none"> ♦ Define and apply integral exponents. ♦ Define and apply rational exponents. 			<ul style="list-style-type: none"> and Pascal's Triangle. ♦ Determine if events are independent or mutually exclusive. 		
<p><u>Assessment</u></p> <ul style="list-style-type: none"> ♦ Tests ♦ Quizzes ♦ Projects 	♦ SAME		♦ SAME	♦ SAME	♦ SAME
<p><u>Resources</u></p> <ul style="list-style-type: none"> ♦ Advanced Mathematics; Brown; McDougal Littell Houghton Mifflin 	♦ SAME		♦ SAME	♦ SAME	♦ SAME
<p><u>Instructional Strategies</u></p> <ul style="list-style-type: none"> ♦ Lecture ♦ Cooperative Learning ♦ Student Presentation ♦ Discovery 	♦ SAME		♦ SAME	♦ SAME	♦ SAME

<p><u>Big Understandings of the Content Area</u></p> <ul style="list-style-type: none"> ♦ Recognize and use a wide variety of functions. ♦ Understand and use trigonometry in triangles and as periodic phenomena. ♦ Understand concepts of limits as an introduction to Calculus. 					
<p><u>Content Standards</u></p> <p>G. PATTERNS, RELATIONS, FUNCTIONS: Students will understand that mathematics is the science of patterns, relationships, and functions.</p>		<p>H. ALGEBRA CONCEPTS: Students will understand and apply algebraic concepts.</p>		<p>J. MATHEMATICAL REASONING: Students will understand and apply concepts of mathematical reasoning.</p>	<p>K. MATHEMATICAL COMMUNICATION: Students will reflect upon and clarify their understanding of mathematical ideas and relationships.</p>
<p><u>Performance Indicators</u> Students will be able to:</p> <ul style="list-style-type: none"> ♦ Create a graph to represent a real-life situation and draw inferences from it. ♦ Translate and solve a real-life problem using symbolic language. ♦ Model phenomena using a variety of functions (linear, quadratic, exponential, trigonometric, etc.). ♦ Identify a variety of situations explained by the same type of function. ♦ Understand and perform transformations such as algebraically combining, composing, and inverting commonly used functions, and using technology to perform such operations on more complicated symbolic expressions. 		<p><u>Performance Indicators</u> Students will be able to:</p> <ul style="list-style-type: none"> ♦ Use tables, graphs, and spreadsheets to interpret expressions, equations, and inequalities. ♦ Investigate concepts of variation by using equations, graphs, and data collection. ♦ Formulate and solve equations and inequalities ♦ Analyze and explain situations using symbolic representations. 		<p><u>Performance Indicators</u> Students will be able to:</p> <ul style="list-style-type: none"> ♦ Analyze situations where more than one logical conclusion can be drawn from data presented. ♦ Use inductive reasoning to make conjectures. ♦ Support reasoning by using models, known facts, properties, or relationships. 	<p><u>Performance Indicators</u> Students will be able to:</p> <ul style="list-style-type: none"> ♦ Restate, create, and use definitions in mathematics to express understanding, classify figures, and determine the truth of a proposition or argument. ♦ Read mathematical presentations of topics within the Learning Results with understanding. ♦ Use appropriate terminology and notation.
<p><u>Knowledge/Skills</u></p> <ul style="list-style-type: none"> ♦ Sketch sin and cos graphs and determine values of functions for special angles. ♦ Find values of tan, cot, sec and csc, and sketch graphs. ♦ Find values of inverse trig 		<ul style="list-style-type: none"> ♦ Solve trig equations using definitions of trig functions. ♦ Use trig identities to solve more difficult trig equations. ♦ Review solution of linear and polynomial equations. ♦ Solve exponential and 		<ul style="list-style-type: none"> ♦ Cross-cutting: used in all areas 	<ul style="list-style-type: none"> ♦ Identify arithmetic and geometric sequences. ♦ Use sigma notation to represent series.

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<p>functions.</p> <ul style="list-style-type: none"> ♦ Find equations of different sin and cos curves and apply these equations to sinusoidal models. ♦ Simplify trig expressions and prove trig identities. ♦ Derive and apply formulas for sum and difference of sin, cos, and tan. ♦ Derive and apply double-angle and half-angle formulas. ♦ Graph polar equations. ♦ Define and apply the natural exponential function. ♦ Define and apply logarithms. ♦ Derive and use change of base formula. ♦ Use coordinates to prove geometric theorems. ♦ Find equations of circles and points of intersection of circles and lines. ♦ Find the equations of ellipses and graph them. ♦ Find the equations of hyperbolas and graph them. ♦ Find equations of parabolas and graph them. ♦ Use sequences defined recursively to solve problems. 	<p>logarithmic equations.</p> <ul style="list-style-type: none"> ♦ Review inverse variation. ♦ Review meaning and determination of vertical and horizontal asymptotes. ♦ Use the intuitive notion of limit to find the limit of a function or quotient of functions and to determine continuity. ♦ Sketch the graph of a rational function, making use of asymptotes. ♦ Use the properties of limits to find limits algebraically. ♦ Estimate the slope of a curve. ♦ Solve systems of second degree equations. ♦ Use eccentricity to define conics. ♦ Develop formula for nth term of arithmetic and geometric sequences. ♦ Investigate existence of limits for infinite sequences. ♦ Find the sum of an infinite geometric series. 				
<p>Assessment</p> <ul style="list-style-type: none"> ♦ SAME 	<ul style="list-style-type: none"> ♦ SAME 		<ul style="list-style-type: none"> ♦ SAME 	<ul style="list-style-type: none"> ♦ SAME 	
<p>Resources</p> <ul style="list-style-type: none"> ♦ SAME 	<ul style="list-style-type: none"> ♦ SAME 		<ul style="list-style-type: none"> ♦ SAME 	<ul style="list-style-type: none"> ♦ SAME 	
<p>Instructional Strategies</p> <ul style="list-style-type: none"> ♦ SAME 	<ul style="list-style-type: none"> ♦ SAME 		<ul style="list-style-type: none"> ♦ SAME 	<ul style="list-style-type: none"> ♦ SAME 	