

**Argenta-Oreana High School  
Trigonometry/Pre-Calculus  
Textbook: Precalculus, 5<sup>th</sup> Edition  
Houghton Mifflin Co., 2001**

<b>Date Semester</b>	<b>IL Learning Standards</b>	<b>Unit and/or Essential Question Content and/or Skills</b>	<b>Assessments and/or Products</b>
Semester 1	8.A.3a, 8.B.4a 8.B.4b 8.B.4b, 8.D.3c  8.B.4b, 8.B.5, 8.D.3c 8.B.4b, 8.B.5, 8.D.3c  8.B.5, 8.C.5  8.A.5, 8.B.4a, 8.D.3a	<p><b><u>Chapter P: Prerequisites</u></b></p> <ul style="list-style-type: none"> <li>• <b>P.1 Real Numbers</b> – order real numbers; use inequalities; evaluate algebraic expressions.</li> <li>• <b>P.2 Exponents and Radicals</b> – use properties of exponents, radicals, and rational exponents; simplify and combine radicals; rationalize denominators.</li> <li>• <b>P.3 Polynomials and Factoring</b> – add, subtract, multiply, and factor polynomials.</li> <li>• <b>P.4 Rational Expressions</b> – find domains of algebraic expressions; simplify rational expressions and complex fractions; add, subtract, multiply, and divide rational expressions.</li> <li>• <b>P.5 Solving Equations</b> – solve linear equations, quadratic equations, polynomial equations of degree three or greater, equations involving radicals, and equations involving absolute values.</li> <li>• <b>P.6 Graphical Representation of Data</b> – plot points in the Cartesian plane; use the Distance Formula and Midpoint Formula; use a coordinate plane to model and solve real-life problems.</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 1		<p><b><u>Chapter 1: Graphs of Equations</u></b></p> <ul style="list-style-type: none"> <li>• <b>1.1 Graphs of Equations</b> – sketch graphs of equations; find x- and y-intercepts of graphs; use symmetry; find equations and sketch graphs of circles; use graphs of equations in real-life problems.</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from</p>

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

<b>Date Semester</b>	<b>IL Learning Standards</b>	<b>Unit and/or Essential Question Content and/or Skills</b>	<b>Assessments and/or Products</b>
		<ul style="list-style-type: none"> <li>• <b>1.2 Linear Equations in Two Variables</b> – use slope to graph linear equations in two variables, write linear equations, and identify parallel and perpendicular lines; use linear equations to model and solve real-life problems.</li> <li>• <b>1.3 Functions</b> – identify, evaluate, and find domains of functions; use functions to model and solve real-life problems.</li> <li>• <b>1.4 Analyzing Graphs of Functions</b> – use the vertical line test for functions; find zeros of functions; determine intervals on which functions increase or decrease; identify even and odd functions; identify and graph functions.</li> <li>• <b>1.5 Shifting, Reflecting, and Stretching Graphs</b> – recognize graphs of common functions; use vertical and horizontal shifts, reflections, and nonrigid transformations to sketch graphs.</li> <li>• <b>1.6 Combinations of Functions</b> – perform arithmetic combinations of functions; find and use compositions of functions.</li> <li>• <b>1.7 Inverse Functions</b> – find and verify inverse functions algebraically and graphically.</li> <li>• <b>1.8 Mathematical Modeling</b> – define and apply direct variation, inverse variation, and joint variation.</li> </ul>	<p>the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 1		<p><b><u>Chapter 2: Polynomial and Rational Functions</u></b></p> <ul style="list-style-type: none"> <li>• <b>2.1 Quadratic Functions</b> – analyze graphs of quadratic functions; write quadratic functions in standard form and sketch graphs; apply quadratic functions to real-life problems.</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom.</p>

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
		<ul style="list-style-type: none"> <li>• <b>2.2 Polynomial Functions of Higher Degree</b> – use transformations to sketch graphs of polynomial functions; use the leading coefficient test and zeros of polynomials to determine the behavior of graphs of polynomial functions.</li> <li>• <b>2.3 Polynomial and Synthetic Division</b> – use long division and synthetic division to divide polynomials; use the Remainder Theorem and Factor Theorem.</li> <li>• <b>2.4 Complex Numbers</b> – use the imaginary unit <math>i</math>; add, subtract, multiply, and divide complex numbers; use the Quadratic Formula to find complex solutions of quadratic equations.</li> <li>• <b>2.5 Zeros of Polynomial Functions</b> – use the Fundamental Theorem of Algebra; find rational zeros and conjugate pairs of complex zeros.</li> <li>• <b>2.6 Rational Functions</b> – find domains; find horizontal, vertical, and slant asymptotes; analyze and sketch graphs of rational functions; use rational functions to solve real-life problems.</li> </ul>	<p>Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 1		<p><b><u>Chapter 3: Exponential Functions and Their Graphs</u></b></p> <ul style="list-style-type: none"> <li>• <b>3.1 Exponential Functions</b> – recognize, evaluate, and graph exponential functions with base <math>a</math> and exponential functions with base <math>e</math>; use exponential functions to model and solve real-life applications.</li> <li>• <b>3.2 Logarithmic Functions</b> -- recognize, evaluate, and graph logarithmic functions with base <math>a</math> and natural logarithmic functions; use logarithmic functions to model</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from</p>

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

<b>Date Semester</b>	<b>IL Learning Standards</b>	<b>Unit and/or Essential Question Content and/or Skills</b>	<b>Assessments and/or Products</b>
Semester 2		<p>and solve real-life applications.</p> <ul style="list-style-type: none"> <li>• <b>3.3 Properties of Logarithms</b> – rewrite log functions with a different base; use properties of logs to evaluate or rewrite log expressions; use properties of logs to expand or condense log expressions; use log functions to model and solve real-life applications.</li> <li>• <b>3.4 Exponential and Logarithmic Equations</b> – solve exponential and logarithmic equations; use exponential and logarithmic equations to model and solve real-life applications.</li> <li>• <b>3.5 Exponential and Logarithmic Models</b> – recognize common types of models involving exponential and logarithmic functions; use exponential decay and growth functions, Gaussian functions, logistic growth functions, and logarithmic functions to model and solve real-life problems.</li> </ul>	<p>the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 2		<p><b><u>Chapter 4: Trigonometry</u></b></p> <ul style="list-style-type: none"> <li>• <b>4.1 Radian and Degree Measure</b> – describe angles; use radian measure; use degree measure; use angles to model and solve real-life problems.</li> <li>• <b>4.2 The Unit Circle</b> – identify a unit circle and its relationship to real numbers; evaluate trigonometric functions using the unit circle; use domain and period to evaluate sine and cosine functions; use a calculator to evaluate trigonometric functions.</li> <li>• <b>4.3 Right Triangle Trigonometry</b> – evaluate trigonometric functions of acute angles; use fundamental</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related</p>

**Argenta-Oreana High School  
Trigonometry/Pre-Calculus  
Textbook: Precalculus, 5<sup>th</sup> Edition  
Houghton Mifflin Co., 2001**

<b>Date Semester</b>	<b>IL Learning Standards</b>	<b>Unit and/or Essential Question Content and/or Skills</b>	<b>Assessments and/or Products</b>
		<p>trigonometric identities; use a calculator to evaluate trigonometric functions; use trigonometric functions to model and solve real-life problems.</p> <ul style="list-style-type: none"> <li>• <b>4.4 Trigonometric Functions of Any Angle</b> – evaluate trigonometric functions of any angle; use reference angles to evaluate trigonometric functions; evaluate trigonometric functions of real numbers.</li> <li>• <b>4.5 Graphs of Sine and Cosine Functions</b> – sketch the graphs of basic sine and cosine functions; use amplitude and period to help sketch the graphs of sine and cosine functions; sketch translations of the graphs of sine and cosine functions; use sine and cosine functions to model real-life data.</li> <li>• <b>4.6 Graphs of Other Trigonometric Functions</b> – sketch the graphs of tangent, cotangent, secant, and cosecant functions.</li> <li>• <b>4.7 Inverse Trigonometric Functions</b> – evaluate the inverse sine function; evaluate other inverse trigonometric functions; evaluate the compositions of trigonometric functions.</li> <li>• <b>4.8 Applications and Models</b> – solve real-life problems involving right triangles; solve real-life problems involving directional bearings; solve real-life problems involving harmonic motion.</li> </ul>	<p>worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 2		<p><b><u>Chapter 5: Analytic Trigonometry</u></b></p> <ul style="list-style-type: none"> <li>• <b>5.1 Using Fundamental Identities</b> – recognize and write the fundamental trigonometric identities; use the</li> </ul>	<p>Students will have the opportunity to use TI-84</p>

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
		<p>trigonometric identities to evaluate trigonometric functions, simplify trigonometric expressions, and rewrite trigonometric expressions.</p> <ul style="list-style-type: none"> <li>• <b>5.2 Verifying Trigonometric Identities</b> – plan a strategy for verifying trigonometric identities; verify trigonometric identities.</li> <li>• <b>5.3 Solving Trigonometric Equations</b> – use standard algebraic techniques to solve trigonometric equations; solve trigonometric equations of quadratic type; solve trigonometric equations involving multiple angles; use inverse trigonometric functions to solve trigonometric equations.</li> <li>• <b>5.4 Sum and Difference Formulas</b> – use sum and difference formulas to evaluate trigonometric functions; use sum and difference formulas to verify identities and solve trigonometric equations.</li> <li>• <b>5.5 Multiple-Angle and Product-to-Sum Formulas</b> – use multiple-angle formulas, power-reducing formulas, half-angle formulas, and product-to-sum formulas to rewrite and evaluate trigonometric functions.</li> </ul>	<p>Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 2		<p><b>Chapter 6: Additional Topics in Trigonometry</b></p> <ul style="list-style-type: none"> <li>• <b>6.1 Law of Sines</b> – use the Law of Sines to solve oblique triangles; find the areas of oblique triangles; use the Law of Sines to model and solve real-life problems.</li> <li>• <b>6.2 Law of Cosines</b> – use the Law of Cosines to solve oblique triangles; use the Law of Cosines to model and solve real-life problems; use Heron’s Area Formula to find</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete</p>

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
		<p>the area of a triangle.</p> <ul style="list-style-type: none"> <li>• <b>6.3 Vectors in the Plane</b> – represent vectors as directed line segments; write the component forms of vectors; perform basic vector operations and represent them graphically; write vectors as linear combinations of unit vectors; find the direction angles of vectors; use vectors to model and solve real-life problems.</li> <li>• <b>6.4 Vectors and Dot Products</b> – find the dot product of two vectors and use the properties of the dot product; find the angle between two vectors; determine whether two vectors are orthogonal; write a vector as the sum of two vector components; use vectors to find the work done by a force.</li> <li>• <b>6.5 Trigonometric Form of a Complex Number</b> – plot complex numbers in the complex plane; write the trigonometric forms of complex numbers.</li> </ul>	<p>assigned problems from the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.</p>
Semester 2		<p><b><u>Chapter 7: Systems of Equations</u></b></p> <ul style="list-style-type: none"> <li>• <b>7.1 Solving Systems of Equations</b> – use the method of substitution and the graphical approach to solve systems of equations in two variables; use systems of equations to model and solve real-life problems.</li> <li>• <b>7.2 Two-Variable Linear Systems</b> – use the method of elimination to solve systems of linear equations in two variables; interpret graphically the numbers of solutions of systems of linear equations in two variables; use systems of equations in two variables to model and solve real-life problems.</li> </ul>	<p>Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related</p>

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
		<ul style="list-style-type: none"> <li>• <b>7.3 Multivariable Linear Systems</b> – recognize linear systems in row-echelon form and use back-substitution to solve the systems; use Gaussian elimination to solve systems of linear equations; solve nonsquare systems of linear equations; use systems of linear equations in three or more variables to model and solve application problems.</li> </ul>	worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.
Semester 2		<p><b><u>Chapter 8: Matrices and Determinants</u></b></p> <ul style="list-style-type: none"> <li>• <b>8.1 Matrices and Systems of Equations</b> – write a matrix and identify its order; perform elementary row operations on matrices; use matrices and Gaussian elimination and Gauss-Jordan elimination to solve systems of linear equations.</li> <li>• <b>8.2 Operations with Matrices</b> – decide whether two matrices are equal; add and subtract matrices; multiply matrices by real numbers; multiply two matrices; use matrix operations to model and solve real-life problems.</li> <li>• <b>8.3 The Inverse of a Square Matrix</b> – verify that two matrices are inverses of each other; use Gauss-Jordan elimination to find the inverses of matrices; use a formula to find the inverses of 2x2 matrices; use inverse matrices to solve systems of linear equations.</li> <li>• <b>8.4 The Determinant of a Square Matrix</b> – find the determinants of 2x2 matrices; find minors and cofactors of square matrices; find the determinants of square matrices.</li> </ul>	Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
		<ul style="list-style-type: none"> <li>• <b>8.5 Applications of Matrices and Determinants</b> – use Cramer’s Rule to solve systems of linear equations; use determinants to find the areas of triangles; use a determinant to find an equation of a line passing through two points; use matrices to code and decode messages.</li> </ul>	a final chapter test.
Semester 2 (if possible)		<p><b><u>Chapter 9: Sequences, Series, and Probability</u></b></p> <ul style="list-style-type: none"> <li>• <b>9.1 Sequences and Series</b> – use sequence notation to write the terms of a sequence; use factorial notation; use summation notation to write sums; find the sum of an infinite series; use sequences and series to model and solve real-life problems.</li> <li>• <b>9.2 Arithmetic Sequences and Partial Sums</b> – recognize and write arithmetic sequences; find an nth partial sum of an arithmetic sequence; use arithmetic sequences to model and solve real-life problems.</li> <li>• <b>9.3 Geometric Sequences and Series</b> – recognize and write geometric sequences; find the nth partial sum of a geometric sequence; find the sum of an infinite geometric series; use geometric sequences to model and solve real-life problems.</li> <li>• <b>9.5 Binomial Theorem</b> – use the Binomial Theorem to calculate binomial coefficients; use Pascal’s Triangle to calculate binomial coefficients; use binomial coefficients to write binomial expansions.</li> <li>• <b>9.6 Counting Principles</b> – solve simple counting problems; use the Fundamental Counting Principle to solve counting problems; use permutations to solve</li> </ul>	Students will have the opportunity to use TI-84 Plus graphing calculators in the classroom. Students may take notes and will complete assigned problems from the textbook. Students may also be required to complete related worksheets or participate in graphing calculator activities. Periodically, the students may have the opportunity to work in small groups or complete work on the dry erase boards. Students will take a final chapter test.

**Argenta-Oreana High School**  
**Trigonometry/Pre-Calculus**  
**Textbook: Precalculus, 5<sup>th</sup> Edition**  
**Houghton Mifflin Co., 2001**

Date Semester	IL Learning Standards	Unit and/or Essential Question Content and/or Skills	Assessments and/or Products
		counting problems; use combinations to solve counting problems. <ul style="list-style-type: none"> <li>• <b>9.7 Probability</b> – find the probability of an event; find the probabilities of mutually exclusive events; find the probabilities of independent events; find the probability of the complement of an event.</li> </ul>	