



**Parma High School**  
**College Algebra and Trigonometry**  
**Scope and Sequence**

<b>Mathematical Practices</b> <ol style="list-style-type: none"> <li>1. Make sense of problems and persevere in solving them.</li> <li>2. Reason abstractly and quantitatively.</li> <li>3. Construct viable arguments and critique the reasoning of others.</li> <li>4. Model with mathematics.</li> <li>5. Use appropriate tools strategically.</li> <li>6. Attend to precision.</li> <li>7. Look for and make use of structure.</li> <li>8. Look for and express regularity in repeated reasoning.</li> </ol>		<b>College Algebra and Trigonometry Focus Areas</b> Focus areas for College Algebra and Trigonometry are (1) discrete mathematics, (2) functions and their graphs, (3) polynomial, power and rational functions, (4) exponential, logistic and logarithmic functions, (5) systems and matrices (6) analytic geometry (7) right triangle trigonometry (8) unit circle and periodicity of functions (9) inverse and composite trig functions (9) trigonometric identities (10) Law of Sines and Cosines (11) applications in vectors, parametric equations, polar coordinates and De Moivre's Theorem.	<b>Major Domains</b> The major domains in High School Math are: <ol style="list-style-type: none"> <li>1. Number and Quantity</li> <li>2. Algebra</li> <li>3. Functions</li> <li>4. Modeling</li> <li>5. Geometry</li> <li>6. Statistics and Probability</li> </ol>			
Weeks	Unit Title	Learning Targets	Vocabulary	Domain/Standards	Resources	
Aug- Early Sept	Discrete Mathematics	Students will compute basic combinatorics. Students will use the Binomial Theorem. Students will be able to determine probabilities. Students will find formulas for arithmetic and geometric sequences, and be able to find sums of arithmetic and geometric series. Students will be able to find measures of central tendency, standard deviations, and percent data in normal distributions.	Binomial Theorem, normal distribution, arithmetic sequence, series and mean, geometric sequence, series and mean, population, sample, standard deviation, finite, infinite.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 9	

Early Sept-Late Sept	Functions and Their Graphs	Students will review functions and their properties, including compositions of functions and finding inverse functions. Students will recognize 12 basic functions. Students will work with parametric relations. Students will model real-world mathematical situations with functions.	Composition of functions, inverse functions, even and odd functions, parametric, domain, range, interval notation, asymptote.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 1
Late Sept-Mid Oct	Polynomial, Power, and Rational Functions	Students will review quadratic equations in vertex or standard form and be able to find the vertex, axis of symmetry, or zeros and model. Students will be able to describe end behavior and find real and complex zeros of polynomial functions of higher degree and model. Students will be able to interpret graphs of rational functions and solve rational equations or inequalities in one variable	Axis of symmetry, discriminant, greatest common factor, parabola, Quadratic Formula, quadratic function, standard form, vertex form, zero of a function, end behavior, limit.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 2
Mid-Oct-Early Nov	Exponential, Logistic and Logarithmic Functions	Students will be able to model real world situations with exponential and logistic functions. Students will recognize properties of logarithmic functions, and be able to graph them. Students will be able to solve exponential, logistic and logarithmic equations.	Exponential, growth, decay, logistic, logarithm, base.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 3
Early Nov - Early Dec	Systems and Matrices	Students will be able to use matrix algebra to solve systems of equations. Students will be able to reduce multivariate linear systems using row operations. Students will be able to work with partial fractions. Students will be able to solve non-linear systems of equations in two variables.	Matrix, matrices, inverse matrix, reduced row echelon form, systems of equations, partial fractions.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 7
Early Dec-Mid-Dec	Analytic Geometry in Two and Three Dimensions	Students will be able to use formulas for circles, ellipses, hyperbolas, and parabolas. Students will recognize translations, and rotation of axes. Students will be introduced to polar equations of conics and the 3D Cartesian coordinate system.	Conic section, ellipses, hyperbolas, polar equations.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 8

Early Jan-Late Jan	Trigonometric Functions	Students will review degrees and radians. Students will use trigonometric functions of acute angles. Students will expand these to circular functions. Students will be able to work with inverse trigonometric functions. Students will apply right angle trigonometry to real world problems involving angles and triangle lengths.	Sine, cosine, tangent, secant, cosecant, cotangent, radian, unit circle.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 4a
Late Jan-Late Feb	Trigonometric Functions and Graphs	Students will be able to find the period, midline and amplitude of a periodic function. Students will be able to graph sine, cosine and tangent functions, including phase shifts. Students will be able to find reciprocal trig functions. Students will be able to graph composite trigonometric functions.	Amplitude, central angle, cycle, midline, sinusoid, period, periodic function, phase shift.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 4b
Early March-Mid March	Law of Sines and Law of Cosines	Students will be able to derive the Law of Sines and Law of Cosines. Students will be able to solve non-right triangles. Students will recognize the ambiguous case. Students will be able to use Heron's formula. Students will be able to find triangle areas. Students will apply the Laws to real world problems.	Law of Sines, Law of Cosines, Heron's Law, ambiguous case.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 5b
Mid March – Mid April	Analytic Trigonometry	Students will review and memorize fundamental trigonometric identities. Students will prove trigonometric identities. Students will be able to use sum and difference, and multiple-angle identities.	Identity, Pythagorean identities, cofunction identities, odd-even identities, double-angle identities, half-angle identities, power-reducing identities.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 5a
Mid April – Mid May	Applications of Trigonometry	Students will be able to use vector operations and applications of vectors. Students will be able to solve parametric equations involving motion. Students will be able to convert to and use polar coordinates and use them to find distances. Students will be able to use De Moivre's Theorem to find nth roots.	Vector, polar coordinate, parametric curves, De Moivre's Theorem, complex plane.	Fourth Courses	Precalculus: Graphical, Numerical, Algebraic, 7 <sup>th</sup> ed. Demana et al., Ch. 6

Parma High School College Algebra/Trigonometry Curriculum Map.