

[Click Here for Distric Rubric](#)

Algebra III

Guiding Principle

A student at the proficient level in Algebra III will be able to demonstrate understanding of high school mathematics by solving problems, reasoning, communicating, representing, making connections and solving word problems based on the following indicators:

Benchmark/Topics	As a result of studying Algebra III, I will be able to:
(1) Matrices <ul style="list-style-type: none"> • Basic Operations • Determinants • Inverse (2x2) • Solving • Linear Programming 	3.4.1 Demonstrate an understanding of matrices when I can <ul style="list-style-type: none"> <input type="checkbox"/> Perform basic matrix operations <input type="checkbox"/> Calculate the determinant of a 2x2 and 3x3 matrix <input type="checkbox"/> Determine the inverse of a 2x2 matrix <input type="checkbox"/> Solve a system of equations using matrix operations <input type="checkbox"/> Solve linear programming problems
(2) Families of Functions <ul style="list-style-type: none"> • Domain and Range • Composition of Functions • Symmetries • Graphs • Inverses • Solve 	7.2.2 Show understanding of families of functions when I can <ul style="list-style-type: none"> <input type="checkbox"/> State the domain and range of a function <input type="checkbox"/> Compose two or more functions <input type="checkbox"/> Prove symmetry of a function about the x-axis, y-axis, origin, and $y = x$ <input type="checkbox"/> Graph functions using the properties of each family of functions (e. g. end behavior, roots, symmetries) <input type="checkbox"/> Derive a functions inverse <input type="checkbox"/> Solve equations from each of the families of functions covered in this course
(3) Polynomial and Rational Functions <ul style="list-style-type: none"> • Remainder Theorem • Factor Theorem • Rational Root Theorem • Asymptotes and Holes • End Behavior • Inequalities 	7.1.3 Show understanding of polynomial and rational functions when I can <ul style="list-style-type: none"> <input type="checkbox"/> Determine a root using the remainder theorem <input type="checkbox"/> Determine a remainder of a polynomial function using the factor theorem <input type="checkbox"/> Determine the rational roots of a polynomial function using the rational root theorem <input type="checkbox"/> Determine vertical, horizontal and slant asymptotes and holes in the graphs of rational functions <input type="checkbox"/> Determine the end behavior of a polynomial function and write its behavior using correct notation (e. g. <input style="width: 100px; height: 15px;" type="text"/>) <input type="checkbox"/> Solve polynomial and rational function inequalities

<p>(4) Trigonometry</p> <ul style="list-style-type: none"> • Identities • Graphing Inverse and Reciprocal Functions • Areas of Triangles • Solving 	<p>7.1.4 Show understanding of trigonometry when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use identities to simplify trigonometric functions <input type="checkbox"/> Prove trigonometric identities <input type="checkbox"/> Graph the inverse and reciprocal trigonometric functions <input type="checkbox"/> Find the area of triangles using Heron's formulas and using two sides of the triangle and an included angle <input type="checkbox"/> Solve trigonometric equations
<p>(5) Vectors and Parametrics</p> <ul style="list-style-type: none"> • Operations • Graphing • Applications 	<p>7.5.5 Demonstrate knowledge of vectors and parametrics when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Perform vector operations <input type="checkbox"/> Show graphical representations of vectors and parametric equations <input type="checkbox"/> Solve problems using vectors and parametric equations
<p>(6) Polars and Complex Numbers</p> <ul style="list-style-type: none"> • Graphing • Operations • Polar Form • Rectangular Form • Polar Coordinates • Rectangular Coordinates 	<p>7.0.6 Demonstrate understanding of polars and complex numbers when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Graph on a polar coordinate system <input type="checkbox"/> Perform operations using complex numbers <input type="checkbox"/> Convert between polar and rectangular forms <input type="checkbox"/> Convert between polar and rectangular coordinates
<p>(7) Conics</p> <ul style="list-style-type: none"> • Recognition • Definitions • Graphing • Critical Points • Systems of Conics 	<p>4.4.7 Demonstrate my understanding of conic sections when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize a conic section from its equation <input type="checkbox"/> Define each conic section in terms of a locus of points <input type="checkbox"/> Graph each conic section and label the distinguishing features of each <input type="checkbox"/> Determine the vertex or vertices, focus or foci, equation of the directrix, equations of asymptotes, major and minor axes <input type="checkbox"/> Find the points of intersection of a system of two or more conics
<p>(8) Series and Sequences</p> <ul style="list-style-type: none"> • Arithmetic • Geometric 	<p>7.5.8 Demonstrate understanding of series and sequences when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize the difference between arithmetic and geometric sequences <input type="checkbox"/> Apply the rules of arithmetic and geometric sequences and series in the appropriate situations

<p>(9) Introduction to Calculus</p> <ul style="list-style-type: none">• Limits• Derivatives• Tangents• Critical Points	<p>7.0.9 Demonstrate a basic understanding of the underpinnings of Calculus when I can</p> <ul style="list-style-type: none"><input type="checkbox"/> Show the limit of a function as x approaches a given value<input type="checkbox"/> Find basic derivatives of polynomial functions<input type="checkbox"/> Find the equation of a line tangent to a curve at a given point<input type="checkbox"/> Find the relative or absolute maximum(s) or minimum(s) and points of inflection of a curve using derivatives
-----------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

*Benchmark Key – State Content Standard . State Benchmark . District Benchmark