
Coal City Unit District #1
Algebra III
Math Curriculum

MA.A3:1 Students will perform operations on vectors and matrix quantities and use them in applications. (VM.6, VM7, VM8, VM10, VM12, REI.9)

- MA.A3:1-1 Add, subtract, and multiply matrices of appropriate dimensions.
- MA.A3:1-2 Find the determinant of square matrices.
- MA.A3:1-3 Find the inverse of a square matrix.
- MA.A3:1-4 Solve systems of equations using matrices.

MA.A3:2 Students will interpret functions (polynomial, quadratics, exponential, logarithmic, conics). (IF7d, IF7e, IF8b, LE2)

- MA.A3:2-1 Find the integer zeros of polynomials when suitable factorizations are available.
- MA.A3:2-2 Estimate the relative maximums and minimum of a polynomial function by looking at a graph of the function.
- MA.A3:2-3 Find the end behavior of a polynomial function.
- MA.A3:2-4 Graph polynomial functions, identifying zeros when suitable factorizations are available.
- MA.A3:2-5 Graph exponential functions.
- MA.A3:2-6 Graph simple rational functions with one vertical asymptote.
- MA.A3:2-7 Identify vertical asymptote of simple rational functions.
- MA.A3:2-8 Solve simple problems using exponential functions.
- MA.A3:2-9 Write exponential functions given a graph, a description of a relationship, or two input-output pairs.
- MA.A3:2-10 Given a function, write the new function that is obtained by a sequence of simple transformations done on this function.
- MA.A3:2-11 Write a polynomial function in standard form given real and complex roots.
- MA.A3:2-12 Write logarithms and exponentials in equivalent forms to solve problems.

MA.A3:3 Students will represent and model with vector quantities. (VM1, VM2, VM3, VM4a, VM5a, VM5b, VM11)

- MA.A3:3-1 Rotate or reflect a vector.
- MA.A3:3-2 Perform operations on vectors including addition, subtraction, and dot products.

MA.A3:4 Students will use trigonometric functions to solve problems. (TF1, TF3, TF5, TF6, TF9)

- MA.A3:4-1 Demonstrate their understanding that radian measure of an angle is the length of the arc on the unit circle subtended by the angle by identifying angles in radians.
- MA.A3:4-2 Find the values of sine, cosine, and tangent using similar triangles and the unit circle.
- MA.A3:4-3 Find trigonometric functions that model periodic phenomena with specified amplitude, frequency, and midline.
- MA.A3:4-4 Use inverse functions to solve trigonometric equations.
- MA.A3:4-5 Use the addition and subtraction formulas for sine and cosine to solve problems.

MA.A3:5 Students will define trigonometric ratios and solve problems involving right triangles. (SRT9, SRT10, SRT11)

- MA.A3:5-1 Find the area of a non-right triangle by using trigonometric ratios.
- MA.A3:5-2 Use the Laws of Sines and Cosines to solve problems.
- MA.A3:5-3 Use the Law of Sines and Cosines to solve application problems in right and non-right triangles (e.g., surveying problems, resultant forces).

MA.A3:6 Students will express geometric properties with equations. (GPE1, GPE2, GPE3)

- MA.A3:6-1 Derive the equation of a circle of a given center and radius.
- MA.A3:6-2 Find the center and radius of a circle given an equation.
- MA.A3:6-3 Derive the equation of a parabola given a combination of the focus, vertex, or directrix.
- MA.A3:6-4 Find the vertex, focus, and directrix given the equation of the parabola.
- MA.A3:6-5 Derive the equation of an ellipse given a combination of the focus, vertex, or co-vertex.
- MA.A3:6-6 Find the focus, vertex, or co-vertex of an ellipse given its equation.
- MA.A3:6-7 Derive the equation of a hyperbola given a combination of the focus, vertex, or co-vertex.
- MA.A3:6-8 Find the focus, vertex, or asymptotes of a hyperbola given its equation.
- MA.A3:6-9 Identify the equations of conics as being a circle, parabola, ellipse, or hyperbola.
- MA.A3:6-10 Graph a circle, parabola, ellipse, and hyperbola.

MA.A3:7 **Students will be able to compute probability and evaluate statistics.**
(CP6, CP7, ID2, CP9, MD6, MD7)

- MA.A3.7-1 Use permutations and combinations to determine the number of ways an event can occur.
- MA.A3.7-2 Compute the probability of compound events.
- MA.A3.7-3 Compute conditional probability.
- MA.A3.7-4 Find the standard deviation of a data set.
- MA.A3.7-5 Determine and identify statistical components of a data set
- MA.A3.7-6 Use binomial theorem to expand binomials.