
Coal City Unit District #1
Algebra 2
Math Curriculum

MA.A2:1 **Students will demonstrate the ability to see structure in expressions.**
(9-12:A.SSE.1a, A.SSE.1b, A.SSE.2, A.SSE.B.3, A.SSE.B.3.A, HSN.RN.A.1, HSA.SSE.A.2)

- MA.A2:1-1 Simplify expressions.
- MA.A2:1-2 Evaluate an expression given within a context.
- MA.A2:1-3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- MA.A2:1-4 Factor a quadratic expression to reveal the zeros of the function it defines.
- MA.A2:1-5 Simplifying an expression using the rules of exponents (product, quotient, power, and negative exponent rule)
- MA.A2:1-6 Extend the properties of exponents into rational exponents.

MA.A2:2 **Students will solve equations and inequalities as a process of reasoning.**
(REI2, REI4a, REI4b, REI7, REI8, REI11, REI12, CED1, CED4, REI3b, CED.A.4, IF.C.7.A, REI.C.5, REI.C.6, REI.B.4.B)

- MA.A2:2-1 Solve linear equations and inequalities in one variable.
- MA.A2:2-2 Solve absolute value equations and inequalities.
- MA.A2:2-3 Write linear functions (given two points, given a point and a slope, given a parallel or perpendicular line, given a graph).
- MA.A2:2-4 Solve a system of two equations.
- MA.A2:2-5 Solve Polynomial equations.
- MA.A2:2-6 Graph the solution to a system of inequalities in two variables.
- MA.A2:2-7 Solve a system of 3 equations of the first degree.
- MA.A2:2-8 Solve quadratic equations, including those involving complex numbers. (Write complex solutions in the form $a \pm bi$ for real numbers a and b .)

MA.A2:3 **Students will create equations or inequalities that describe numbers or relationships. (CED.A.1, CED.A.2)**

- MA.A2:3-1 Create equations and inequalities in one variable and use them to solve problems.
- MA.A2:3-2 Create equations and inequalities in two or more variables to represent relationships between quantities.

- MA.A2:4 Students will demonstrate an understanding of the concept of a function and use function notation. (IF4, IF5, IF6, IF7a, IF7b, IF7c, IF7d, IF8, IF9, IF.A.1, IF.A.2, IF.B.6, IF.C.7, REI.D.10, HSF.IF.C.7.D)**
- MA.A2:4-1 Interpret parts of a given or constructed graph, including vertex, axis of symmetry, maximum/minimum, y-intercepts, zeros, domain and range.
 - MA.A2:4-2 Interpret and apply that a function from one set (domain) to another set (range) assigns to each element of the domain exactly one element of the range.
 - MA.A2:4-3 Evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
 - MA.A2:4-4 Graph linear functions and inequalities.
 - MA.A2:4-5 Graph piecewise & polynomial functions
 - MA.A2:4-6 Graph absolute value functions and inequalities.
 - MA.A2:4-7 Graph quadratic functions and inequalities.
 - MA.A2:4-8 Graph radical functions.
 - MA.A2:4-9 Graph rational & exponential functions.
- MA.A2:5 Students will build functions. (BF1c, BF2, BF4a, BF4b, BF4d, BF5, HSF.BF.B.3, IF7d, IF7e, IF8b, LE2)**
- MA.A2:5-1 Build new functions from existing functions.
 - MA.A2:5-2 Perform operations with functions and compositions of functions.
 - MA.A2:5-3 Find the inverse of a function.
 - MA.A2:5-4 Simplify logarithms, including converting, change of base
 - MA.A2:5-5 Determine if a relationship is a direct or inverse relationship, or neither.
 - MA.A2:5-6 Find a given term in an arithmetic or geometric sequence
- MA.A2:6 Students will use complex numbers in polynomial identities and equations. (CN2, CN7, CN8, CN9, HSN.CN.A.3)**
- MA.A2:6-1 Use Euler's notation ($3i$, etc) to simplify square roots.
 - MA.A2:6-2 Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.
 - MA.A2:6-3 Add and subtract complex numbers.
 - MA.A2:6-4 Multiply complex numbers.
 - MA.A2:6-5 Find the conjugate of a complex number and use the conjugate to find the quotients of complex numbers.

MA.A2:7 Students will demonstrate an understanding of arithmetic performed on polynomials, rational or radical expressions, and rational or radical equations. (A.SSE2, APR3, APR7, HSN.RN.A.2, HSA.APR.D.7, HSA.REI.B.3)

- MA.A2:7-1 Simplify radical expressions. (nth roots)
- MA.A2:7-2 Add and subtract radical expressions.
- MA.A2:7-3 Multiply radical expressions.
- MA.A2:7-4 Rationalize the denominator and use the conjugate with radical expressions.
- MA.A2:7-5 Solve radical equations.
- MA.A2:7-6 Solve rational exponent equations.
- MA.A2:7-7 Simplifying rational expressions.
- MA.A2:7-8 Add and subtract rational expressions.
- MA.A2:7-9 Multiply and divide rational expressions.
- MA.A2:7-10 Simplify complex fractions.
- MA.A2:7-11 Solve rational equations.

MA.A2:8 Students will use and interpret categorical and quantitative data. (ID6)

- MA.A2:8-1 Represent data on two quantitative variables on a scatter plot, and interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- MA.A2:8-2 Compute (using technology) and interpret the correlation coefficient of a linear fit.
- MA.A2:8-3 Fit a function to quadratic data represented.
- MA.A2:8-4 Represent data with plots on the real number line (dot plots, histograms, stem-leaf, and box plots) and identify the shape of the data distribution as uniform, skewed right/left, or normal.
- MA.A2:8-5 Interpret differences in shape, center, and spread in the context of the data, accounting for effects of outliers.

MA.A2:9 Students will use the rules of probability to compute probabilities of compound events. (HSS.CP.B.9)

- MA.A2:9-1 Construct and interpret two-way frequency tables of data and use the two-way table as a sample space to calculate conditional probabilities.
- MA.A2:9-2 Calculate probabilities using the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$
- MA.A2:9-3 Calculate probabilities using the general Multiplication Rule $P(A \text{ and } B) = P(A)P(B|A) = P(B)P(A|B)$
- MA.A2:9-4 Use permutations/combinations to compute probabilities of compound events and solve problems.