Comstock Public Schools
Algebra I POWER STANDARDS

L1.1   Number Systems and Number Sense

- **L1.1.1**   <u>Know</u> the different properties that hold in different number systems, and <u>recognize</u> that the applicable properties change in the transition from the positive integers, to all integers, to the rational numbers, and to the real numbers.

- **L1.1.3**   <u>Explain</u> how the properties of associativity, commutativity, and distributivity, as well as identity and inverse elements, are used in arithmetic and algebraic calculations.

- **L1.1.4**   <u>Describe</u> the reasons for the different effects of multiplication by, or exponentiation of, a positive number by a number less than 0, a number between 0 and 1, and a number greater than 1.

L1.2   Representations and Relationships

- **L1.2.4**   <u>Organize</u> and <u>summarize</u> a data set in a table, plot, chart or spreadsheet; <u>find</u> patterns in a display of data; <u>understand and critique</u> data displays in the media.

L2.1   Calculation Using Real and Complex Numbers

- **L2.1.2**   <u>Calculate</u> fluently with numerical expression involving exponents; <u>use the rules</u> of exponents; <u>evaluate</u> numerical expressions involving rational and negative exponents; <u>transition easily between</u> roots and exponents.

A1.1   Construction, Interpretation, and Manipulation of Expressions (linear, quadratic, polynomial, power and exponential)

- **A1.1.1**   <u>Give a verbal description</u> of an expression that is presented in symbolic form, <u>write</u> an algebraic expression from a verbal description, and <u>evaluate</u> expressions given values of the variables.

- **A1.1.2**   <u>Know</u> the properties of exponents and roots, and <u>apply</u> them in algebraic expressions.

- **A1.1.3**   <u>Factor</u> algebraic expressions using, for example, greatest common factor, grouping, and the special product identities.

A1.2 Solutions of Equations and Inequalities

- **A1.2.1**   <u>Write</u> equations and inequalities with one or two variables to represent mathematical or applied situations, and <u>solve.</u>

- **A1.2.3**   <u>Solve</u> (and justify steps in solutions) linear and quadratic equations and inequalities, including systems of up to three linear equations with three unknowns; <u>apply</u> the quadratic formula appropriately.

- **A1.2.8***   <u>Solve</u> an equation involving several variables (with numerical or letter corfficients) for a designated variable, and <u>justify</u> steps in the solution.

A2.1 Definitions, Representations and Attributes of Function

- **A2.1.1**   <u>Determine</u> whether a relationship (given in contextual, symbolic, tabular, or graphical form) is a function; and <u>identify</u> its domain and range.

- **A2.1.3**   <u>Represent</u> functions in symbols, graphs, tables, diagrams, or words, and <u>translate</u> among representations.

- **A2.1.6**   <u>Identify</u> the zeros of a function, the intervals where the values of a function are positive or negative, and <u>describe</u> the behavior of a function as x approaches positive or negative infinity, given the symbolic and graphical representations.

A2.2 Operations and Transformations with Functions

- **A2.2.2***   <u>Apply</u> given transformations to parent functions, and <u>represent</u> symbolically.

A2.3 Representations of Functions

- **A2.3.1***   <u>Identify</u> a function as a member of a family of functions based on its symbolic or graphical representation; <u>recognize</u> that different families of functions have different asymptotic behavior.

A2.4 Models of Real-world Situations Using Families of Functions

- **A2.4.1***   <u>Identify</u> the family of function best suited for modeling a given real-world situation.

- **A2.4.2***   <u>Adopt the general symbolic form</u> of a function to one that fits the specifications of a given situation by using the information to replace arbitrary constant with numbers.
- **A2.4.3***   Using the adapted general symbolic for, <u>draw reasonable conclusions</u> about the situation being modeled.

A3.1   Lines and Linear Functions

- **A3.1.1**   <u>Write</u> the symbolic forms of linear functions (standard, point-slope, and slope-intercept) given appropriate, information, and <u>convert between forms.</u>

- **A3.1.2**   <u>Graph lines</u> (including those of the form x=h and y=k) given appropriate information.

A3.2   Exponential and Logarithmic Functions

- **A3.2.1**   <u>Write</u> the symbolic form and sketch the graph of an exponential function given appropriate information.

- **A3.2.4**   <u>Understand and use</u> the fact that the base of an exponential function determines whether the function increases or decreases and how the base affects the rate of growth or decay.

A3.3   Quadradic Functions

- **A3.3.1**   <u>Write</u> the symbolic form and <u>sketch</u> the graph of a quadratic function given appropriate information (e.g., vertex, intercepts, etc.)

- **A3.3.2**   <u>Identify</u> the elements of a parabola (vertex, axis of symmetry, direction of opening) given its symbolic form or its graph, and <u>relate</u> these elements to the coefficient(s) of the symbolic form of the function.

A3.4   Power Functions (including roots, cubics, quartics, etc.)

- **A3.4.1**   <u>Write</u> the symbolic form and <u>sketch</u> the graph of power functions.

- **A3.4.2**   <u>Express</u> directly and inversely proportional relationships as functions and <u>recognize</u> their characteristics.

A3.5 Polynomial Functions

- **A3.5.1**   <u>Write</u> the symbolic form and <u>sketch</u> the graph of simple polynomial functions.

- **A3.5.2**   <u>Understand</u> the effects of degree, leading coefficient, and number of real zeros on the graphs of polynomial functions of degree greater than 2.

S2.1 Scatterplots and Correlation

- **S2.1.1**   <u>Construct</u> a scatterplot for a bivariate data set with appropriate labels and scales.

- **S2.1.2**   Given a scatterplot, <u>identify</u> patterns, clusters, and outliers; <u>recognize</u> no correlation, weak correlation, and strong correlation.

S2.2 Linear Regression

- **S2.2.1**   For bivariate data which appear to form a linear pattern, <u>find</u> the least squares regression line by estimating visually and by <u>calculating</u> the equation of the regression line; <u>interpret</u> the slope of the equation for a regression line.

- **S2.2.2**   Use the equation of the least squares regression line to <u>make appropriate predictions</u>.