MATHEMATICS

Algebra and Functions

Grade 7		
1. Students express quantitative relationships using algebraic terminology, expressions, equations, inequalities and their graphs. 7.1.1 Use variables and appropriate operations to write an expression, equation, inequality, or system of equations or inequalities which represent a verbal description (e.g., three less than a number, half as large as area A) 7.1.2 Use order of operations correctly to evaluate algebraic expressions such as $3(2x + 5)^2$ 7.1.3 Simplify numerical expressions by applying properties of rational numbers (identity, inverse, distributive, associative, commutative), and justify the process used 7.1.4 Use algebraic terminology correctly (e.g., variable, equation, term, coefficient, inequality, expression, constant) 7.1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in terms of the situation represented by the graph	**2. Students interpret and evaluate expressions involving integer powers and simple roots.** 7.2.1 Interpret positive whole number powers as repeated multiplication and negative whole number powers as repeated division or multiplication by the multiplicative inverse; Simplify and evaluate expressions that include exponents 7.2.2 Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials, when the latter results in a monomial with an integer exponent	**3. Students graph and interpret linear and some non-linear functions.** 7.3.1 Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems 7.3.2 Plot the values from the volumes of a 3-D shape for various values of its edge lengths (e.g., cubes with varying edge lengths or a triangle prism with a fixed height and a varying length equilateral triangle base) 7.3.3 Graph linear functions, noting that the vertical change (change in y-value) per unit horizontal change (change in x-value) is always the same and know that the ratio ("rise over run") is called the slope of a graph 7.3.4 Plot values of the quantities whose ratio is always the same (cost vs. number of an item, feet vs. inches, circumference vs. diameter of a circle); fit a line to the plot and understand that the slope of the line equals the quantities

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4. Students solve simple linear equations and inequalities over the rational numbers. 7.4.1 Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution(s) in terms of the context from which they arose and verify the reasonableness of the results 7.4.2 Solve multi-step problems involving rate, average speed, distance and time, or direct variation		