

WESTBROOK SCHOOL DEPARTMENT

Math Essential Outcomes for Grades 6-12

What Students Need to Know and Be Able to Do

(Grade 6)	(Grade 7)	(Grade 8)	(Grade 9-12 – Algebra I)	(Grade 9-12 – Algebra II)	(Grade 9-12 - Geometry)
<ul style="list-style-type: none"> • Applies the rules for order of operation to simplify expressions • Adds and subtracts multi-digit numbers with decimals • Multiplies multi-digit numbers with decimals • Divides whole numbers and decimals with two-digit divisors • Divides a decimal by a decimal • Uses exponential notation as repeated multiplication using a calculator • Adds and subtracts fractions with like denominators • Adds and subtracts fractions with unlike denominators • Adds and subtracts mixed numbers with like denominators • Adds and subtracts mixed numbers with unlike denominators • Multiplies fractions • Multiplies mixed numbers • Divides fractions • Divides mixed numbers • Reduces fractions to lowest terms • Converts proper fractions into decimals by dividing the numerator by the denominator • Compares and orders mixed numbers and fractions • Compares and orders decimals • Calculates the area and perimeter of squares and rectangles • Classifies triangles by angles and lines • Finds the mean, median, mode and range for a set of data (using a calculator) • Shows understanding of data using graphs, tables, charts and line plots • Determines the theoretical probability of simple events • Graphs ordered pairs on a coordinate grid in the first quadrant • Solves word problems 	<ul style="list-style-type: none"> • Create Bar & Line Graphs • Apply the concepts of theoretical & experimental probability • Evaluate expressions using the order of operations • Name, classify, and measure angles • Add, subtract, multiply, and divide integers • Solve one-step equations using the inverse operations • Translate language based word problems into corresponding algebraic mathematical sentences • Add, subtract, multiply, and divide mixed numbers • Multiply and divide with decimals • Using ratios and proportions to identify unit rates and solve word problems • Convert between fractions, decimals, and percents 	<ul style="list-style-type: none"> • Express numbers as fractions, decimals, and percents, including those less than one percent and greater than 100 • Solve for part, whole, and percent in problems using an equation • Solve for part, whole, and percent in problems using a proportions • Use ratios to form proportions and solve problems • Simplify expressions using the correct order of operations, including square roots, exponents, and absolute values • Calculate rates and unit rates • Calculate perimeter and area of rectangles and circles and find volume of rectangular prisms and cylinders • Solve one and two step equations using inverse operations • Translate English sentences into algebraic expressions and equations • Given data, calculate and analyze central tendencies (mean, median, mode) • Use a coordinate system to define and locate position • Calculate the probability of simple events and make predictions by applying the theories of probability • Find all possible combinations and arrangements involving a limited number of variables • Use statistics, tables, and graphs to communicate ideas and information in convincing presentations and analyze presentations of others for bias or deceptive presentation • Identify when geometric figures are similar and use similarity to solve problems • Find percent of change (including discount and markup) • Use graphs to represent two variable equations • Calculate x and y intercepts and slope of a linear equation • Demonstrate inequalities on a number line • Use the 4-Step problem solving method (understand the problem; make a plan; follow the plan; look back) as an approach to solving word problems 	<ul style="list-style-type: none"> • Simplify algebraic expressions • Demonstrate basic computation skills with real numbers • Utilize the properties of equality to solve linear equations involving grouping symbol's • Apply linear equations to solve real-world problems • Solve compound inequalities • Utilize the connections between equations, tables, and graphs to recognize patterns and write equations based on those patterns • Write linear equations given various conditions and use these equations to solve problems • Graph linear equations using various techniques • Solve systems of equations and inequalities • Demonstrate computational skills as they apply to polynomials • Solve quadratic equations by factoring • Solve rational equations • Simplify radical expressions • Solve radical equations 	<ul style="list-style-type: none"> • Solve inequalities involving absolute value • Apply characteristics of graphs of linear equations to make predictions for real-world problems • Identify and graph special functions • Model real-world situations using linear programming • Solve real-world problems using systems of equations with three variables • Find the solutions of equations and inequalities involving polynomials and radicals in the set of complex numbers • Solve quadratic equations using various techniques • Solve polynomial functions using various techniques • Solve polynomial functions using various techniques • Recognize and sketch graphs of inverse functions, square root functions and inequalities • Solve rational equations and inequalities • Explore the characteristics and equations of the conic sections through graphing 	<ul style="list-style-type: none"> • Write geometric proofs involving segments and/or angle relationships • Use the relationships formed by parallel lines and transversals to write and solve linear equations • Analyze geometric relationships in order to make and verify conjectures involving triangles • Use the special segments in triangles and inequalities formed by the part of triangles to solve problems • Write and use ratios and proportions to solve algebraic and geometric problems • Use properties of triangles to solve problems • Use properties of quadrilaterals to solve problems • Use theorems involving the properties of circles and their special segments to write and solve linear equations • Use areas of various two dimensional figures to solve problems • Use geometric probability to solve problems • Use surface area of various three dimensional figures to solve problems • Use volumes of various three dimensional figures to solve problems