



Mathematics Benchmark Achievements Senior Math

Ages 12+
College Bound

Objectives at this age:

Continue with a systematic approach to developing math skills.

Please note that levels listed below are not correlated with age or grade.

Math programs and curriculum may be selected to teach the following math concepts to prepare students to begin College Algebra.

Math Skills	Level 7	Level 8
Whole Numbers		
System of numeration	x	
The Four Operations/combined operations	x	
Factors and multiples	x	
Prime numbers and prime factorization	x	
Greatest common factor	x	
Least common multiple	x	
Number patterns	x	
Variables	x	
Basic number laws (commutative, associative, distributive)	x	
Input / Output tables	x	
Fractions, Decimals, Approximation		
Equivalent, reduced, comparison, improper and mixed #'s	x	
Addition and subtraction	x	
Multiplication and division	x	
Decimals (Four operations: +, -, x, ÷)	x	
Approximation (Rounding and significant figures)	x	
Conversion between fractions and decimals	x	
Real Numbers		
The Number Line	x	

Negative numbers	x	
Adding and subtracting integers	x	
Multiplication of Integers	x	
Absolute value and additive inverse property of addition	x	
Signed integers and symbols in order of operations	x	
Division of integers	x	
Real numbers: Rational and irrational	x	
Order of calculation	x	
Exponents		x
Zero and negative indices		x
Squares and square roots; Cubes and cube roots		
Square roots introduction	x	
Perfect squares	x	
Add/subtract square roots	x	
Simplifying roots and radicals	x	
Simplifying radicands that are not perfect squares	x	
Multiply/divide radical expressions	x	
Cube roots and other indices	x	
Roots and variables	x	
Standard Form and Scientific Notation		
Identifying base and exponent		x
Using base ten with exponents		x
Scientific notation explanation		x
Converting scientific notation to standard form		x
Negative exponents		x
Negative exponents and scientific notation		x
Converting standard form back to scientific notation		x
Advanced Exponents		
Advanced negative exponents		x
Exponential expressions		x
Multiplication rule for exponents and exponential expressions		x
Dividing expressions with the same base		x
Dividing exponential expressions		x
Raising a power to a power		x
Add/subtract exponential expressions		x

Distributive property and exponents		x
Algebraic Expressions		
Algebraic notation	x	
Evaluation of algebraic expressions	x	
Terms, brackets, like terms	x	
Special algebraic rules and expanding products		x
Factorization		x
Addition and subtraction of algebraic fractions		x
Multiplication and division of algebraic fractions		x
Fractional equations		x
Addition and subtraction of polynomials		x
Multiplication of polynomials		x
Division of polynomials		x
Algebraic manipulation		x
Open sentences and equations		
Equivalent equations and solving	x	
Equations with fraction and decimal coefficients	x	
Literal equations (letters are used to replace numerical coefficients)		x
Quadratic equations		x
Quadratic factorization		x
Solving quadratic equations by factorization		x
Word problems using open sentences and equations		x
Inequalities		x
Solving inequalities		x
Rate, ratio, and percentage		
Rate and speed	x	
Ratio	x	
Direct and inverse proportions	x	
Percentage	x	
Word problems with rate, ratio, and percentages		x
Financial transactions		
Profit, loss, commissions and discounts	x	
Interest – simple and compound	x	
Taxation and money exchange	x	
Word problems using financial transactions		x

Graphs		
The coordinate plane		x
Graphs of linear equations in two variables		x
Simple applications of straight line graphs		x
Solving simultaneous linear equations by graphs		x
Quadratic graphs		x
Linear equations		
Simultaneous linear equations		x
Elimination method		x
Substitution method		x
Geometry		
Line segment, line and angles	x	
Angle properties related to straight lines	x	
Perpendicular and parallel lines	x	
Angle properties related to parallel lines	x	
Polygons	x	
Angle properties of a triangle	x	
Isosceles and equilateral triangles	x	
Angle properties of a polygon	x	
Quadrilaterals	x	
Angle properties of a quadrilateral	x	
Congruent and similar triangles		x
Cones and pyramids – volume and area		x
Pythagoras theorem		x
Indirect measure		x
Symmetries and nets of solid figures		x
Line symmetry	x	
Rotations symmetry	x	
Patterns	x	
Symmetry of a solid figure	x	
Nets of solid figures	x	
Area and Perimeter	x	
Perimeter and area of a polygon	x	
Circumference and area of circle	x	
Volume, surface area and density	x	

Volume and surface area of prism and cylinder	x	
Density	x	
Similarity and congruence	x	
Similar and congruent figures	x	
Designs and tessellations	x	
Scale drawings	x	
Trigonometry		
Trigonometrical ratios		x
Solution of right angled triangles		x
Motion geometry		
Reflection		x
Rotation		x
Translation		x
Enlargement		x
Combination of transformations		x
Statistics		
Collecting and presenting data		x
Reading data (Graphs – bar, line, circle, scatter plots)		x
Frequency distribution		x
Mean, mode and median of frequency distributions		x
Types of averages		x
Probability		x
Identify certain and impossible events		x
Making decisions with probability		x
Showing probability with fractions		x
Showing probability with decimal/percent		x
Comparing probabilities		x
Random vs. skill		x
Comparing compound events		x
Tree diagrams and lists		x
Making predictions with probability		x
Making predictions with data		x