

Comparison of Shormann Algebra 2 and Saxon Algebra 2

Shormann Algebra 2 teaches about 99% of the concepts in Saxon Algebra 2, 3rd ed., plus the concepts required for the redesigned PSAT and SAT exams, the ACT, and CLEP College Algebra and College Mathematics exams. For the few concepts Saxon teaches but Shormann does not, those are not covered on one of the exams mentioned above.

	Saxon	Shormann
Arithmetic		
History of Arithmetic		
Origin of Arithmetic Symbols		•
Whole Numbers		
Round whole numbers	•	•
Operations with Whole Numbers		
Add Whole Numbers		•
Subtract Whole Numbers		•
Multiply Whole Numbers		•
Divide Whole Numbers		•
Fractions		
Add Fractions		•
Subtract Fractions		•
Multiply Fractions		•
Divide Fractions		•
Convert between mixed numbers and improper fractions		•
Decimal Numbers		
Understand Decimal Numbers		•
Order Decimal Numbers on the Number Line		•
Round Decimal Numbers		•
Round Repeating Decimal Numbers	•	•
Convert Decimal Numbers to Fractions		•
Convert Decimal Numbers to Percents		•
Add And Subtract Decimal Numbers	•	•
Multiply And Divide Decimal Numbers	•	•
Understand and Use Scientific Notation		
For Large And Small Numbers	•	•
With Addition Of Exponents	•	•
In Multiplication	•	•
In Division	•	•
In Approximating		•
On a Scientific Calculator	•	•
In Unit Conversions		•
In Ideal Gas Law Problems	•	•
Graphs (Analytical Geometry)		
Descartes and Fermat and history of analytical geometry		•
Graphs of Data		

Interpret and construct bar graphs		•
Interpret and construct broken line graphs		•
Interpret and construct pie graphs		•
Graphs on the Coordinate Plane		
Define axes, coordinates, quadrants, and origin	•	•
Recognize and Plot Ordered Pairs	•	•
Use the Distance Formula	•	•
Graph Linear Equations		
Equation Of A Line	•	•
By Substitution	•	•
To Solve Systems Of Equations	•	•
Finding Slopes	•	•
Slope Formula	•	•
y-Intercept	•	•
Vertical And Horizontal Lines	•	•
Parallel and Perpendicular Lines	•	•
Using Slope-Intercept Form	•	•
Given Two Ordered Pairs	•	•
Given Slope	•	•
Given Experimental Data	•	•
Find best-fit line using linear regression on calculator and/or computer		•
Use combinations of algebraic, tabular, graphical, or verbal descriptions of linear functions		•
Interpret situations in terms of given graphs or create situations that fit graphs		•
Consistent, Inconsistent, and Dependent	•	•
Graph Circles, Ellipses, Hyperbolas, and Parabolas	•	•
Identify graphic and symbolic forms of the following nonlinear functions: absolute value, quadratic, square root, exponential, cubic, reciprocal		•
Determine whether or not given situations can be represented by linear or nonlinear functions		•
Complex Plane		•
Graphing $a+bi$		•
Graphing Inequalities		
Inequalities on a number line		
Absolute value	•	•
Quadratic	•	•
Linear and nonlinear inequalities	•	•
Systems of linear and nonlinear inequalities		•
Number Sets		
History of Number		
Other Numeral Systems, including binary (for computer math), Roman Numerals, Sexagesimal		•
Origin of Zero		•
Infinity		•

Infinitesimal		•
Sets		
Use Set Notation	•	•
Distinguish Between Finite and Infinite	•	•
Understand Set Membership	•	•
Represent Subsets of the Real Numbers Symbolically	•	•
Represent Subsets of the Real Numbers Using Diagrams		•
Identify Subsets	•	•
Find intersection and unions of sets	•	•
Use Venn diagrams	•	•
Interval notation (open and closed)		•
Real Numbers		
Classify the Real Numbers		
Natural (Counting) Numbers and Whole Numbers	•	•
Integers, Rational Numbers, and Irrational Numbers	•	•
Order on a Number Line		•
Compute sums, products, differences, and quotients of decimal numbers		•
Perform operations with integers	•	•
Addition	•	•
Subtraction	•	•
Multiplication	•	•
Division	•	•
Symbols of Inclusion	•	•
Absolute Value	•	•
Identifying negative numbers		•
Opposites with multiple signs		•
Within order of operations	•	•
Parentheses	•	•
Parentheses, braces, and brackets	•	•
Understanding elementary number theory	•	•
Factors and Divisibility		•
Find least common multiples		•
Find reciprocals	•	•
Find greatest common factors		•
Understand inverse operations		•
Convert from base 2 to 10 and vice-versa		•
Know the properties of real numbers	•	•
Chart of properties		•
Commutative property of addition and multiplication	•	•
Associative property of Addition and Multiplication		•
Distributive Property	•	•
Additive Inverse	•	•
Multiplicative Inverse	•	•
Additive Identity	•	•
Multiplicative Identity		•

Of zero		•
Of -1		•
Of 1		•
Of equality		•
Additive Property		•
Of zero		•
Of equality	•	•
Complex Numbers		
Euler's notation for $i = \text{square root of } -1$	•	•
Use the standard form for a complex number	•	•
Understand imaginary numbers	•	•
Add complex numbers	•	•
Multiply complex numbers	•	•
Divide complex numbers	•	•
Multiply complex conjugates	•	•
Find complex roots of quadratic equations	•	•
Measurement		
The Lord abhors dishonest weights and measures(Deuteronomy 25:16, Proverbs 20:23, etc.)		•
English Measurement		
Know U.S. Customary units of length and volume		•
Metric Measurement		
Know the metric units of length and volume	•	•
Conversion by Unit Multipliers		
Convert within English system		
in./ft, ft/yd, ft/mi	•	•
Multiple unit multipliers	•	•
Volume	•	•
Area	•	•
Rate	•	•
Convert within metric system		
cm/m, km/m	•	•
Multiple unit multipliers	•	•
Area	•	•
Volume	•	•
Convert between english and metric units		
Length	•	•
Area	•	•
Volume	•	•
Rate conversions with 2 unit multipliers		•
Foreign Currency Conversion		
Convert US to foreign and vice-versa		•
Convert foreign to foreign using 2 unit multipliers		•
Ratio, Proportion, Percent, and Rate		
History of Ratio		

Define ratio	•	•
Connect idea of ratio to rational, logos, and other areas like language, unity and diversity		•
Greek's discovery of square root of 2 and problems they had		•
History of pi, golden ratio, etc.		•
Ratio		
Solve ratio word problems	•	•
Express Rates as ratios	•	•
Compare unit prices		•
Solve Rate Problems	•	•
Solve advanced ratio problems involving totals	•	•
Use the ideal gas law($PV=nRT$, $PV/T = k$)	•	•
Proportion		
Cross multiply to solve proportions	•	•
Use scale factors on geometric shapes	•	•
Solve similar triangles for missing sides	•	•
Use proportions with chemical compounds	•	•
Percent		
Find percents of numbers	•	•
fraction/decimal/percent conversion		•
Use the percent equation	•	•
Solve percent word problems	•	•
Use percents in chemical weight problems	•	•
Visualize percents using diagrams	•	
Use percents greater than one hundred	•	•
Solve percent increase/decrease problems	•	•
Rate		
Change rates using multipliers	•	•
Solve uniform motion problems	•	•
Solve boat in the river problems	•	
Exponents		
Know order of operations with exponents	•	•
Evaluate expressions with exponents	•	•
Simplify powers of fractions	•	•
Simplify powers of signed numbers	•	•
Know the product theorem for exponents	•	•
Evaluate powers of negative bases	•	•
Use negative exponents	•	•
Solve equations with exponents	•	•
Use zero as an exponent		•
Know the quotient rule for exponents		•
Know the power theorem for exponents	•	•
Use the exponent calculator key	•	•
Understand exponential increase and decrease	•	•
Understand and use fractional exponents	•	•

Roots		
Find square roots, cube roots, and fourth roots	•	•
Know order of operations with roots		•
Evaluate expressions with roots		•
Take root of negative numbers	•	•
Know the product of square roots rule	•	•
Add radical expressions	•	•
Multiply radical expressions	•	•
Find roots of large numbers		•
Solve radical equations	•	•
Know the quotient theorem for roots	•	•
Rationalize denominators	•	•
Simplify roots of roots	•	•
Convert roots to fractional exponents	•	•
Use Euler's notation	•	•
Evaluate roots with a scientific calculator	•	•
Statistics and Probability		
Probability		
Use counting techniques to compute probability	•	•
Simple Probability	•	•
Independent events	•	•
Product of probabilities	•	•
Fundamental counting principle		•
Permutations	•	•
Combinations		•
Statistics		
Use and construct stem-and-leaf plots	•	•
Use and construct histograms		•
Compute measures of central tendency	•	•
Understand normal curves	•	•
Understand standard deviation	•	•
Linear regressions on calculator/computer		•
Using Punnett Squares		•
Using Hardy-Weinberg equation		•
Using Chi Square		•
Algebraic Expressions		
Simplifying expressions		
Combine like terms		
Simple	•	•
With exponents	•	•
With negative exponents	•	•
Simplify exponential expressions		
With exponentials and radicals/powers rule	•	•
With fractional exponents	•	•
With variable exponents	•	•

With signed numbers	•	•
Explanation	•	•
Evaluation with signed numbers	•	•
Multiplication and division	•	•
With negative signs/positive or negative exponents	•	•
Distributive property and negative exponents		•
Evaluate expressions with substitution		
For variables	•	•
With symbols of inclusion	•	•
With signed numbers	•	•
With signed numbers and symbols of inclusion	•	•
Simplifying expressions using		
Distributive property	•	•
Order of operations		•
With fractions		•
With symbols of inclusion		•
Reduce expressions by common factor	•	•
Find the least common multiple of expressions	•	•
Find the greatest common factor of expressions		•
Simplify radical expressions		
Addition	•	•
Multiplication	•	•
Using conjugates	•	
Radical in parentheses, raised to a whole number power		•
Simplify Polynomial expressions		
Monomials	•	•
Binomials	•	•
Difference of two squares	•	•
Sum and difference of two cubes	•	•
Trinomials	•	•
Simple factoring	•	•
Common factors	•	•
Common factor sums		•
Lead coefficients greater than one	•	•
Degrees of polynomials	•	•
Addition of polynomials	•	•
Multiplication of Polynomials	•	•
Division of Polynomials		
Simple	•	•
Missing term in dividend	•	•
With two variables	•	•
Factoring by grouping		•
Expanding Polynomials		•
Simplify rational expressions	•	•
Multiplication	•	•

Addition	•	•
Factoring		
Before multiplication	•	•
Before addition	•	•
Division	•	•
Denominators		
Factoring	•	•
Rationalizing		
By multiplication by radical	•	•
Using conjugates	•	•
Simplify complex fractions	•	•
Denominator-numerator same-quantity rule	•	•
Multiplicative property of equality	•	•
Additive property of equality	•	•
Advanced	•	•
Simplify complex numbers	•	•
Addition of like terms	•	•
Euler's notation	•	•
Using conjugate of the denominator	•	•
Multiple step	•	•
Multiplication	•	•
Division	•	•
Algebraic Equations		
History of Algebra		•
Define algebra, etymology		•
Sawyer's "bag of rocks" idea to bridge algebra and arithmetic		•
Simplifying and solving equations		
Define equations and basic rules	•	•
Simple	•	•
Conditional	•	•
Equivalent	•	•
Addition and Subtraction rules	•	•
Multiplication and Division rules	•	•
Use the fractional-part-of-a-number equation	•	•
Solve abstract equations	•	•
Use the decimal-part-of-a-number equation	•	•
Solve equations with mixed numbers	•	•
Solve equations using least common multiple	•	•
Use the percent equation	•	•
Solve multiple-step equations	•	•
Using two rules	•	•
Format	•	•
Variables on each side of equals sign	•	•
Two-step	•	•
Multiple terms	•	•

Multivariable abstract	•	•
Advanced	•	•
Euler word problems		•
Solve equations that have negative coefficients		•
Solve equations that have symbols of inclusion		•
Solve equations using distributive property	•	•
Translate word phrases into algebraic expressions	•	•
Translate word sentences into algebraic expressions	•	•
Solving equations involving variation	•	•
Direct and inverse variation	•	•
Squared		•
As ratio	•	•
Joint and combined	•	•
Solve rational equations	•	•
Solve radical equations	•	•
Linear Equations		
Find linear equations to fit experimental data	•	•
Find equations of lines	•	•
Using slope intercept form	•	•
Given two points	•	•
Parallel to given lines	•	•
With given slopes	•	•
Finding slopes	•	•
Perpendicular to given lines	•	•
Horizontal and vertical lines	•	•
Slope formula	•	•
Distance Formula	•	•
Graph linear equations	•	•
Simple	•	•
Rearranging before graphing	•	•
For solution	•	•
Slope-intercept method	•	•
Solve two equations in two unknowns (systems of equations)	•	•
Substituting	•	•
For variable	•	•
One variable for another variable	•	•
Advanced	•	•
Rearranging before substitution	•	•
Subscripted variables	•	•
With fractions and decimal numbers	•	•
Using linear combination (elimination)	•	•
With angular relationship	•	•
Elimination of a variable	•	•
Subscripted variables	•	•
With fractions and decimal numbers	•	•

By graphing	•	•
Simple	•	•
With fractions and decimal numbers	•	•
Consistent, inconsistent, and dependant equations	•	•
Solve three equations and three unknowns	•	•
Nonstandard solutions to systems of equations		•
Quadratic Equations		
Solve by factoring	•	•
Use difference of two squares theorem	•	•
Complete the square	•	•
Use the quadratic formula	•	•
Identify lead coefficients	•	•
Use discriminants	•	•
Nonstandard solutions to quadratic equations		•
Other types of Equations		
Solve logarithmic equations	•	•
Solve exponential equations	•	•
Solve exponential growth problems	•	•
Find compound interest with calculator	•	•
Find roots of equations	•	•
Lead coefficients and completing the square	•	•
Complex roots	•	•
Using quadratic formula	•	•
Irrational roots	•	•
Discriminants	•	•
Solve equations with applications	•	•
Simple and compound interest	•	•
Markup and markdown	•	
Coin problems	•	•
Chemical mixture problems	•	•
Age problems	•	•
Euler word problems		•
Explore nonlinear equations	•	•
Circles and ellipses	•	•
Parabolas	•	•
Hyperbolas	•	•
Solve systems of equations		
Using elimination and substitution	•	•
By completing the square	•	•
Algebraic Skills (Functions)		
Understanding functions	•	•
Define domain, range, independent variable, and dependent variable	•	•
Find domain and range from graphs of functions		•
Find domain and range from symbolic forms of functions		•
Use function notation	•	•

Interpret and makes inferences from functional relationships		•
Use the vertical line test (function or relation)	•	•
Represent functions as ordered pairs	•	•
Manipulating and Evaluating Functions	•	•
Multiply functions	•	•
Add functions	•	•
Graph and evaluate exponential functions	•	•
Evaluate trigonometric functions	•	•
Modeling functions		
Graphically	•	•
Numerically	•	•
Symbolically	•	•
Verbally	•	•
Describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations		•
Operations with functions (addition, subtraction, multiplication, division)	•	•
Inverse functions		
Find symbolic form of inverse of a function		•
Identify a function and its inverse by their graphs		•
Composite functions		•
Evaluate functions	•	•
Graph and evaluate exponential functions	•	•
Evaluate trig functions	•	•
Nonstandard evaluations using symbols like *, #,		•
Evaluating Scientific Formulas		
Ideal Gas Law	•	•
Evaluate a variety of scientific formulas	•	•
Trigonometry and Logarithms		
Trigonometry		
Define and use sine, cosine, and tangent	•	•
Evaluate trigonometric and inverse trigonometric functions with a scientific calculator	•	•
Solve right triangles	•	•
Define vectors	•	•
Use Parallelogram Law to sketch location of resultant vectors		•
Addition of vectors (resultant)	•	•
Negative vectors	•	•
Force vectors (resultant)	•	•
Periodicity		•
Modeling graphic, numeric and symbolic forms of sine and cosine		•
Unit Circle		•
Logarithms		
Logarithm means exponent	•	•
Solve simple logarithmic equations	•	•
Find logarithms with a scientific calculator	•	•

Find antilogarithms with a scientific calculator	•	•
Know the laws of logarithms	•	•
Geometry		
History of Geometry		
Euclid and axioms, postulates, deductive reasoning		•
Aristotle, logic and syllogisms		•
Deductive Reasoning and Proofs		
Define and compare deductive and inductive reasoning	•	•
Euclid, axioms and postulates	•	•
Euclid, theorems and proofs		•
Concept of proof and proof technique	•	•
Use of proof in various professions		•
Triangle Congruency		
Triangle proofs	•	•
Prove theorems about lines	•	•
Prove theorems about angles	•	•
Prove theorems about circles	•	•
Prove theorems about parallelograms	•	•
Prove theorems about rhombuses	•	•
Prove theorems about trapezoids	•	•
Truth Tables		
conjunctions and disjunctions		•
implications and negations		•
converse, inverse and contrapositive		•
Construction		
Construct and justify statements about geometric figures and their properties	•	•
Use construction to prove Euclid's Propositions I - V (Book 1)		•
Copy angles	•	•
Copy line segments	•	•
Construct perpendicular bisectors	•	•
Construct angle bisectors		•
Construct triangles and rectangles	•	•
Lines, points, segments, and planes		
Identify lines		•
Intersecting	•	•
Parallel	•	•
Transversals	•	•
In Space	•	•
Skew	•	•
Perpendicular bisectors	•	•
Identify points and find distances between points	•	•
Identify segments	•	•
Characteristics		•
Proportional	•	•
Bisectors	•	•

Identify planes and planes in space	•	•
Angles		
Identify vertices of angles	•	•
Identify kinds of angles		
Right, acute, straight, and obtuse angles	•	•
Complementary and supplementary angles	•	•
Adjacent angles	•	•
Vertical angles	•	•
Reflex angles	•	•
Corresponding interior and exterior angles	•	•
Alternate interior and exterior angles	•	•
Remote interior angles	•	•
Use inscribed angles	•	•
Find the sum of the angles in a polygon	•	•
Use angles with vectors		
To find rectangular coordinates	•	•
To change from rectangular to polar form	•	•
Addition	•	•
Negative	•	•
Force at a point	•	•
Polygons		
Classify polygons	•	•
Convex and concave	•	•
Equilateral and equiangular	•	•
By number of sides	•	•
Triangles	•	•
Quadrilaterals	•	•
Inscribed	•	•
Squares	•	•
Trapezoids	•	•
Trapezium		•
Parallelograms	•	•
Rhombuses	•	•
Rectangles	•	•
Pentagons	•	•
Hexagons	•	•
Understand regularity of polygons	•	•
Understand regularity of polygons	•	•
Translate, rotate, and reflect polygons	•	•
Identify vertices of polygons	•	•
Draw diagonals of polygons	•	•
Circles		
Identify parts of circles	•	•
Radii and diameters	•	•
Chords	•	•

Arcs, sectors and central angles	•	•
Secants and tangents	•	•
Draw circumscribed and inscribed circles	•	•
Use degree measures	•	•
Convert between radians and degrees		•
Triangles		
Classify triangles	•	•
Right, obtuse, acute, scalene, isosceles, and equilateral	•	•
30-60-90	•	•
45-45-90	•	•
Find measures of angles	•	•
Solve similar triangle problems		
Two triangles	•	•
Overlapping triangles	•	•
Application to find height of tree, length of unknown, etc.		•
Geometric Solids		
Identify cylinders and prisms	•	•
Identify circular and right circular cones	•	•
Identify rectangular and square pyramids	•	•
Identify spheres	•	•
Perimeter and Circumference		
Compute perimeters of shapes	•	•
Define π	•	•
Compute circumferences	•	•
Circles	•	•
Semicircles	•	•
Area		
Find areas of polygons	•	•
Rectangles and squares	•	•
Triangles	•	•
Parallelograms and trapezoids	•	•
Find areas of complex shapes	•	•
Made of two or more polygons	•	•
Made of polygons and semicircles	•	•
As differences (area of shaded region)	•	•
Find areas of circles, sectors, and semicircles	•	•
Surface Area and Volume		
Find surface areas of geometric solids	•	•
Right circular cylinders	•	•
Triangular prisms and rectangular pyramids	•	•
Circular cones	•	•
Spheres	•	•
Complex shapes as the base	•	•
Find volumes of geometric solids	•	•
Right cylinders and prisms	•	•

