

Algebra I

Course Description: Algebra I is a course that take the basic math concepts learned in junior high and starts developing them into a higher math. In Algebra I, a student will learn the core ingredients of algebra and should have a good foundation for Algebra II.

Textbook: *Algebra I for Christian Schools* (BJU Press)

Goal 1: To understand positive and negative numbers and to use them in all operations.

- _____ 1.1 The student will locate given positive and negative numbers on the number line.
- _____ 1.2 The student will give the absolute value of given signed numbers.
- _____ 1.3 The student will add two numbers of the same sign.
- _____ 1.4 The student will add two numbers of opposite sign.
- _____ 1.5 The student will add several signed numbers having mixed signs.
- _____ 1.6 The student will multiply two signed numbers.
- _____ 1.7 The student will divide two signed numbers.
- _____ 1.8 The student will write a composite number as the product of its prime factors.

Goal 2: To have number sense.

- _____ 2.1 The student will perform operations with rational numbers.
- _____ 2.2 The student will perform operations of different kinds using order of operations.
- _____ 2.3 The student will evaluate square roots and radicals.
- _____ 2.4 The student will perform operations while properly observing grouping symbols.

Goal 3: To become familiar with variables.

- _____ 3.1 The student will express an unknown quantity using a variable.
- _____ 3.2 The student will evaluate algebraic expressions when values for each variable are given.
- _____ 3.3 The student will identify and combine like terms.
- _____ 3.4 The student will perform the distributive property.
- _____ 3.5 The student will calculate quantities using formulas, when values for all variables are supplied.
- _____ 3.6 The student will express equivalence as an equation using variables.

Goal 4: To become familiar with techniques for solving equations.

- _____ 4.1 The student will identify opposite operations.
- _____ 4.2 The student will perform operations to both sides of an equation.
- _____ 4.3 The student will solve equations in one variable having one variable term.
- _____ 4.4 The student will solve equations in one variable having one variable term on each side of the equation.
- _____ 4.5 The student will solve equations involving absolute value.

- _____ 4.6 The student will express word problems in the form of an equation in one variable.
- _____ 4.7 The student will solve word problems that can be expressed as an equation in one variable.

Goal 5: To become familiar with techniques for solving inequalities.

- _____ 5.1 The student will identify the difference between solving equations and solving inequalities.
- _____ 5.2 The student will solve single inequalities and graph the solution on the number line.
- _____ 5.3 The student will classify a combined inequality as a conjunction or a disjunction.
- _____ 5.4 The student will solve combined inequalities and graph the solution on the number line.
- _____ 5.5 The student will solve absolute value inequalities and graph the solution on the number line.

Goal 6: To become familiar with graphing linear relations in two variables.

- _____ 6.1 The student will locate a point on the coordinate plane given an ordered pair.
- _____ 6.2 The student will identify the y-intercept of a line.
- _____ 6.3 The student will identify the slope of a line from the graph of the line.
- _____ 6.4 The student will calculate the slope of a line from the coordinates of two points on the line.
- _____ 6.5 The student will write the slope-intercept form of the equation of a line from the graph of the line.
- _____ 6.6 The student will write the equation of a line using the point-slope form of the equation of a line.
- _____ 6.7 The student will find the equation of a line using two points on the line.

Goal 7: To become familiar with systems of equations.

- _____ 7.1 The student will solve systems of equations by graphing.
- _____ 7.2 The student will solve systems of equations by substitution.
- _____ 7.3 The student will solve systems of equations by the addition method.
- _____ 7.4 The student will solve word problems involving equations in two variables by using systems of equations.

Goal 8: To understand polynomials.

- _____ 8.1 The student will classify polynomials according to the number of terms.
- _____ 8.2 The student will add polynomials.
- _____ 8.3 The student will subtract polynomials.
- _____ 8.4 The student will multiply monomials.
- _____ 8.5 The student will multiply a polynomial by a monomial.
- _____ 8.6 The student will multiply two polynomials.

- _____ 8.7 The student will divide a polynomial by a monomial.
- _____ 8.8 The student will divide a polynomial by another polynomial.

Goal 9: To understand factoring algebraic expressions.

- _____ 9.1 The student will factor a polynomial by the factoring out the common monomial.
- _____ 9.2 The student will factor a binomial as the difference of two squares.
- _____ 9.3 The student will factor a trinomial square.
- _____ 9.4 The student will factor a quadratic trinomial.
- _____ 9.5 The student will factor a polynomial that uses multiple factoring methods.

Goal 10: To understand radical expressions.

- _____ 10.1 The student will evaluate square root expressions.
- _____ 10.2 The student will simplify radical expressions.
- _____ 10.3 The student will multiply radical expressions.
- _____ 10.4 The student will divide radical expressions.
- _____ 10.5 The student will rationalize the denominator of a radical expression.
- _____ 10.6 The student will add or subtract radical expressions.
- _____ 10.7 The student will apply the Pythagorean theorem to solve a right triangle.
- _____ 10.8 The student will apply the distance formula.
- _____ 10.9 The student will solve radical equations.

Goal 11: To understand quadratic equations.

- _____ 11.1 The student will apply the zero product property.
- _____ 11.2 The student will solve quadratic equations by factoring.
- _____ 11.3 The student will solve quadratic equations by taking square roots.
- _____ 11.4 The student will solve quadratic equations by completing the square.
- _____ 11.5 The student will solve quadratic equations using the quadratic formula.

Goal 12: To understand rational expressions.

- _____ 12.1 The student will simplify rational expressions.
- _____ 12.2 The student will multiply rational expressions.
- _____ 12.3 The student will divide rational expressions.
- _____ 12.4 The student will add and subtract rational expressions.
- _____ 12.5 The student will add and subtract rational expressions having different denominators.
- _____ 12.6 The student will add and subtract complex rational expressions.

Goal 13: To become familiar with rational equations.

- _____ 13.1 The student will solve rational equations with numerical denominators.
- _____ 13.2 The student will solve rational equations with polynomial denominators.
- _____ 13.3 The student will solve rational equations involving word problems.

_____ 13.4 The student will algebraically rearrange rational literal equations.

Goal 14: To become familiar with quadratic functions.

_____ 14.1 The student will visually identify the graph of a quadratic function.

_____ 14.2 The student will locate the vertex of a parabola on the coordinate plane.

_____ 14.3 The student will identify the concavity of a parabola from the function.

_____ 14.4 The student will identify the x- and y-intercepts of a parabola.

_____ 14.5 The student will interpret the meaning of the graph of a quadratic function that describes a specific situation.