

# ModuMath Algebra

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## **Algebra 1 - Getting Acquainted With Algebra**

- 1) Translate words into the language of algebra.
- 2) Evaluate algebraic expressions.
- 3) Evaluate formulas and other expressions.

## **Algebra 2 - Order of Operations**

- 1) Use the standard order of operations to simplify and evaluate numerical or algebraic expressions.
- 2) Simplify and evaluate numerical and algebraic expressions that contain parentheses.

## **Algebra 3 - Adding and Subtracting Algebraic Expressions**

- 1) Identify the terms in algebraic expressions.
- 2) Identify like terms in algebraic expressions.
- 3) Identify the special types of polynomials called monomials, binomials and trinomials.
- 4) Add and subtract any type of polynomials.

## **Algebra 4 - Multiplying Polynomials**

- 1) Multiply any two polynomials.
- 2) Apply the FOIL method as a shortcut in multiplying two binomials.
- 3) Use formulas to obtain special products of the form  $(a + b)^2$ ,  $(a - b)^2$  and  $(a + b)(a - b)$ .

## **Algebra 5 - Laws of Algebra**

- 1) Recognize five basic laws of algebra.
- 2) Apply these laws to certain algebraic operations.

## **Algebra 6 - Solving Equations I**

- 1) Recognize the identities for addition and multiplication.
- 2) Recognize the inverses for addition and multiplication.
- 3) Use the identities and inverses in solving equations.

## **Algebra 7 - Solving Equations II**

- 1) Solve multiple step first degree equations.
- 2) Use some shortcuts to solve equations.
- 3) Understand and work with literal equations.

## **Algebra 8 - Using Equations to Solve Problems**

- 1) Use equations, tables and diagrams to solve practical problems.

## **Algebra 9 - Solving Practical Problems**

- 1) Find formulas to describe relationships between quantities in practical problems.
- 2) Use formulas to organize the information in problems and to identify the variables.
- 3) Use formulas and organized information to develop equations.
- 4) Use formulas and organized information to check solutions.

**Algebra 10 - Inequalities**

- 1) Identify inequality symbols and use them to write algebraic statements.
- 2) Identify the solution sets of inequalities on a number line.
- 3) Combine two inequalities in one compound inequality.
- 4) Solve inequalities.
- 5) Solve word problems using inequalities.

**Algebra 11 - Linear Equations and Graphs I**

- 1) Identify linear equations.
- 2) Identify linear equations that produce vertical or horizontal lines.
- 3) Use graphs, equations and ordered pairs to examine the relationships between variables.
- 4) Plot points and draw lines on the coordinate plane.

**Algebra 12 - Linear Equations and Graphs II**

- 1) Use the term "slope" to describe lines and rates of change.
- 2) Find the slope of lines on graphs.
- 3) Find the slope of a line when given two of its points.
- 4) Define the slope of horizontal and vertical lines.

**Algebra 13 - Linear Equations and Graphs III**

- 1) Find the slope of a line from its equation.
- 2) Write any linear equation in slope intercept form.
- 3) Use an equation in slope-intercept form to find the slope and y-intercept of its line.
- 4) Graph a line from its equation using the slope and y-intercept.

**Algebra 14 - Linear Equations and Graphs IV**

- 1) Write an equation for a line with a given slope and y-intercept.
- 2) Write an equation for a line with a given slope through a given point.
- 3) Write an equation for a line through two given points.

**Algebra 15 - Systems of Linear Equations I**

- 1) Solve a system of two linear equations by graphing.
- 2) Solve a system of two linear equations by substitution.
- 3) Determine how many solutions a system of linear equations has.
- 4) Explain how the number of solutions to a system can be determined from a graph.
- 5) Solve word problems using systems of two linear equations.

**Algebra 16 - Systems of Linear Equations II**

- 1) Solve systems of equations using the elimination method.
- 2) Solve more word problems using systems of equations.

**Algebra 17 - Systems of Linear Equations III**

- 1) Use the elimination method to solve systems in which the terms have no additive inverses.
- 2) Use the elimination method to solve systems that have terms with coefficients that are fractions.
- 3) Use the elimination method to solve systems in which one or both of the coordinates in the solution are fractions.

### **Algebra 18 - Systems of Linear Equations IV**

- 1) Determine whether a given problem can be solved with one variable and/or two variables.
- 2) Define the two unknowns in a word problem using a single variable and using two variables.
- 3) Write equations to solve word problems both when the unknowns have been identified using one variable and when the unknowns have been identified using two variables.
- 4) Solve a given word problem with either one equation or with a system of equations.

### **Algebra 19 - Exponents**

- 1) Identify expressions in simplified standard form.
- 2) Use the rules for exponents to simplify expressions.
- 3) Use the rules of exponents to divide a polynomial by a monomial.

### **Algebra 20 - Factoring I**

- 1) Find the greatest common factor of a polynomial.
- 2) Factor the greatest common factor from a polynomial.

### **Algebra 21 - Factoring II**

- 1) Factor a polynomial with four terms by grouping.
- 2) Factor a perfect square trinomial.
- 3) Factor a binomial that is the difference of two perfect squares.

### **Algebra 22 - Factoring III**

- 1) Factor a quadratic trinomial.
- 2) Factor a trinomial in quadratic form.

### **Algebra 23 - Roots & Radicals I**

- 1) Use appropriate radical notation for expressions involving square roots.
- 2) Find the square roots of perfect squares.
- 3) Reduce and simplify square roots of integers that are not perfect squares.
- 4) Find or simplify the square root of monomials.
- 5) Write radicals with rational exponents and vice-versa.

### **Algebra 24 - Roots & Radicals II**

- 1) Multiply and divide two radicals.
- 2) Add or subtract two radicals.
- 3) Rationalize the denominator.

### **Algebra 25 - Quadratic Equations I**

- 1) Identify quadratic equations in standard form.
- 2) Solve quadratic equations by taking the square root of each side of the equation.
- 3) Solve quadratic equations by factoring.
- 4) Solve word problems that include quadratic equations.

### **Algebra 26 - Quadratic Equations II**

- 1) Solve quadratic equations using the quadratic formula.
- 2) Solve word problems that include quadratic equations.

**Algebra 27 - Rational Expressions I**

- 1) Identify rational expressions and determine if there are any excluded values.
- 2) Evaluate rational expressions for given values of the variables.
- 3) Fully reduce a rational expression.
- 4) Multiply two rational expressions and give the product in its fully reduced form.
- 5) Divide two rational expressions and give the quotient in its fully reduced form.

**Algebra 28 - Rational Expressions II**

- 1) Add or subtract two rational expressions that have the same denominator.
- 2) Add or subtract two rational expressions that have different denominators.
- 3) Simplify complex fractions.

**Algebra 29 - Rational Expressions III**

- 1) Solve equations that include rational expressions.
- 2) Check the solutions to the equations.
- 3) Solve word problems that involve equations which include rational expressions.

**Algebra 30 - Rational Expressions IV**

- 1) Solve word problems that involve writing equations that include rational expressions.
- 2) Solve "work" and "rate-time-distance" problems that involve writing equations that include rational expressions.

**Algebra 31 - The Pythagorean Theorem and Other Formulas**

- 1) Identify the hypotenuse of right triangles.
- 2) Use the Pythagorean Theorem to find the missing side of a right triangle when the lengths of two sides are known.
- 3) Use the Pythagorean Theorem to determine if a given triangle is a right triangle.
- 4) Use right triangles to solve some simple applications.
- 5) Use the Distance Formula to find the distance between two points on a plane.
- 6) Use the Midpoint Formula to find the point that is midway between two points on a line.

**Algebra 32 - Proportion and Variation**

- 1) Write ratios as fractions or decimals.
- 2) Write and solve proportions.
- 3) Use proportions to solve practical problems.
- 4) Write formulas for direct and inverse variation.
- 5) Use the formulas to solve variation problems.