

## Algebra 1 Power Standards

2012-2013

*Algebra I students will be able to...*

**1. Apply algebraic thinking to problem solving. (throughout the course)**

A1.1.B. Solve problems that can be represented by linear functions, equations, and inequalities.

A1.1.D. Solve problems that can be represented by quadratic functions and equations.

A1.8.B. Select and apply strategies to solve problems.

A1.8.E. Read and interpret diagrams, graphs, and text containing the symbols, language, and conventions of mathematics.

**2. Recognize, write, solve, graph, and interpret all aspects of linear equations and functions and simplify and factor polynomials.**

A1.1.C. Solve problems that can be represented by a system of two linear equations or inequalities.

A1.3.A. Determine whether a relationship is a function and identify the domain, range, roots, and independent and dependent variables.

A1.4.B. Write and graph an equation for a line given the slope and the y-intercept, the slope and a point on the line, or two points on the line, and translate between forms of linear equations.

A1.4.C. Identify and interpret the slope and intercepts of a linear function, including equations for parallel (and perpendicular\*) lines.

**3. Recognize, manipulate, simplify and factor polynomials.**

A1.2.C. Interpret and use integer exponents and square and cube roots, and apply the laws and properties of exponents to simplify and evaluate exponential expressions.

A1.2.E. Use algebraic properties to factor and combine like terms in polynomials.

A1.2.F. Add, subtract, multiply, and divide polynomials.

**4. Understand the algebraic representation of one and two variable data.**

A1.6.B. Make valid inferences and draw conclusions based on data.

A1.6.D. Find the equation of a linear function that best fits bivariate data that are linearly related, interpret the slope and y-intercept of the line, and use the equation to make predictions.

A1.6.E. Describe the correlation of data in scatterplots in terms of strong or weak and positive or negative.

**5. Recognize and solve simple quadratic equations.**

A1.5.C. Solve quadratic equations that can be factored as  $(ax + b)(cx + d)$  where  $a$ ,  $b$ ,  $c$ , and  $d$  are integers.

## Algebra 1 Power Standards

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*The standards listed below in italics are not part of the guaranteed and viable curriculum.*

### **Apply algebraic thinking to problem solving. (throughout the course)**

- A1.1.A. Select and justify functions and equations to model and solve problems.*
- A1.1.C. Solve problems that can be represented by a system of two linear equations (or inequalities).*
- A1.2.D. Determine whether approximations or exact values of real numbers are appropriate, depending on the context, and justify the selection.*
- A1.6.B. Make valid inferences and draw conclusions based on data.*
- A1.8.A. Analyze a problem situation and represent it mathematically.*
- A1.8.C. Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.*
- A1.8.D. Generalize a solution strategy for a single problem to a class of related problems, and apply a strategy for a class of related problems to solve specific problems.*
- A1.8.F. Summarize mathematical ideas with precision and efficiency for a given audience and purpose.*
- A1.8.G. Synthesize information to draw conclusions, and evaluate the arguments and conclusions of others.*
- A1.8.H. Use inductive reasoning about algebra and the properties of numbers to make conjectures, and use deductive reasoning to prove or disprove conjectures.*

### **Recognize, write, solve, graph, and interpret all aspects of linear equations and functions and simplify and factor polynomials.**

- A1.1.A. Select and justify functions and equations to model and solve problems.*
- A1.2.A. Know the relationship between real numbers and the number line, and compare and order real numbers with and without the number line.*
- A1.2.B. Recognize the multiple uses of variables, determine all possible values of variables that satisfy prescribed conditions, and evaluate algebraic expressions that involve variables.*
- A1.3.B. Represent a function with a symbolic expression, as a graph, in a table, and using words, and make connections among these representations.*
- A1.3.C. Evaluate  $f(x)$  at  $a$  (i.e.,  $f(a)$ ) and solve for  $x$  in the equation  $f(x)=b$ .*
- A1.4.A. Write and solve linear equations and inequalities in one variable.*
- A1.4.D. Write and solve systems of two linear equations (and inequalities\*) in two variables.*
- A1.4.E. Describe how changes in the parameters of linear functions and functions containing an absolute value of a linear expression affect their graphs and the relationships they represent.*
- A1.7.D. Solve an equation involving several variables by expressing one variable in terms of the others.*

### **Understand the algebraic representation of one and two variable data.**

- A1.6.A. Use and evaluate the accuracy of summary statistics to describe and compare data sets.*
- A1.6.E. Describe the correlation of data in scatterplots in terms of strong or weak and positive or negative.*
- A1.6.C. Describe how linear transformations affect the center and spread of univariate data.*

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### **Recognize and solve simple quadratic equations.**

- A1.1.D. Solve problems that can be represented by quadratic functions and equations.*
- A1.5.A. Represent a quadratic function with a symbolic expression, (as a graph\*), in a table, and with a description, and make connections among the representations.*
- A1.5.B. Sketch the graph of a quadratic function, describe the effects that changes in the parameters have on the graph, and interpret the x-intercepts as solutions to a quadratic equation.*
- A1.5.D. Solve quadratic equations that have real roots by completing the square and by using the quadratic formula.*

### **Recognize and use simple exponential functions and sequences.**

- A1.1.E. Solve problems that can be represented by exponential functions and equations.*
- A1.7.A. Sketch the graph for an exponential function of the form  $y=ab^n$  where  $n$  is an integer, describe the effects that changes in the parameters  $a$  and  $b$  have on the graph, and answer questions that arise in situations modeled by exponential functions.*
- A1.7.B. Find and approximate solutions to exponential equations.*
- A1.7.C. Express arithmetic and geometric sequences in both explicit and recursive forms, translate between the two forms, explain how rate of change is represented in each form, and use the forms to find specific terms in the sequence.*