

**Pennsylvania State Core Curriculum**  
**Standards adopted 2010**  
**Algebra I**

Strand	Reference	Description	Boardworks High School Algebra presentations
<b>2.1. Numbers, Number Systems and Number Relationships</b>	2.1.A1.A.	Model and compare values of irrational numbers.	–
	2.1.A1.B.	Use factoring to create equivalent forms of polynomials.	Factoring Factoring quadratic expressions Quadratic equations and factoring
	2.1.A1.C.	Use ratio and proportion to model relationships between quantities.	Ratio Dividing in a given ratio Direct proportion Inverse proportion
	2.1.A1.D.	Use exponential, scientific, and calculator notation to represent any rational number.	Scientific notation Calculations involving scientific notation Exponents
	2.1.A1.E.	Apply the concepts of prime and composite monomials to determine GCFs (Greatest Common Factor) and LCMs (Least Common Multiple) of monomials.	LCM and GCF
	2.1.A1.F.	Extend the concept and use of inverse operations to determine unknown quantities in linear and polynomial equations.	Solving linear equations Using equations to solve problems Solving quadratic equations
<b>2.2. Computation and Estimation</b>	2.2.A1.C.	Evaluate numerical expressions that include the four basic operations and operations of powers and roots, reciprocals, opposites, and absolute values.	Algebraic fractions Exponents Zero, negative and fractional exponents Manipulating radicals Absolute value functions
<b>2.3. Measurement and</b>	2.3.A1.C.	Find missing quantities in measurement formulas by applying equation solving techniques.	Substituting into formulas Formula problems Rearranging a formula Generating formulas

<b>Estimation</b>	2.3.A1.E.	Describe how a change in the value of one variable in a formula that utilizes linear variables affects the value of the measurement.	Substituting into formulas Formula problems Rearranging a formula Generating formulas
<b>2.4. Mathematical Reasoning and Connections</b>	2.4.A1.A.	Demonstrate the capability of justifying any step in an equation solving process by citing an algebraic property.	–
	2.4.A1.B.	Use if...then format to describe properties and theorems in algebra.	–
<b>2.5. Mathematical Problem Solving and Communication</b>	2.5.A1.A.	Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts.	–
	2.5.A1.B.	Use symbols, mathematical terminology, standard notation, mathematical rules, graphing, and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.	–
<b>2.6. Statistics and Data Analysis</b>	2.6.A1.A.	Design and conduct an experiment using random sampling.	Specifying the problem and planning Methods of sampling part 1 Methods of sampling part 2
	2.6.A1.C.	Select or calculate the appropriate measure of central tendency, calculate and apply the interquartile range for one-variable data, and construct a line of best fit and calculate its equation for two-variable data.	The mode The mean The median Which measure of central tendency The range and interquartile range Scatter plots Lines of best fit
	2.6.A1.E.	Make predictions based on lines of best fit or draw conclusions on the value of a variable in a population based on the results of a sample.	Lines of best fit

<p><b>2.7. Probability and Predictions</b></p>	<p>2.7.A1.A.</p>	<p>Calculate probabilities for independent, dependent, or compound events.</p>	<p>Introduction to probability          Probabilities of single events          Combined events part 1          Combined events part 2          Probabilities from tables and Venn diagrams          Dependent events          Probability notation</p>
	<p>2.8.A1.B.</p>	<p>Evaluate and simplify not understood algebraic expressions, for example: sums of polynomials, products/quotients of exponential terms and product of a binomial times a trinomial; and solve and graph linear equations and inequalities.</p>	<p>Exponents          Operations with polynomials          Solving linear equations          Linear graphs          Inequalities          Solving linear inequalities          Inequalities and regions          Inequalities in two variables</p>
	<p>2.8.A1.C.</p>	<p>Identify and represent patterns algebraically and/or graphically.</p>	<p>Sequences and rules          Arithmetic sequences          Other types of sequences</p>
	<p>2.8.A1.D.</p>	<p>Demonstrate an understanding and apply properties of functions (domain, range) and characteristics of linear functions.</p>	<p>Linear graphs          Functions and relations          Domain, range and composite functions          Inverse functions</p>

<b>2.8. Algebra and Functions</b>	2.8.A1.E.	Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations, and inequalities, and functional relationships that model problem situations.	<p>Solving linear equations Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables Systems of equations and graphs The elimination method for systems of equations The substitution method for systems of equations Systems of linear and quadratic equations Problems leading to systems of equations</p>
	2.8.A1.F.	Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model.	<p>Solving linear equations Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables Systems of equations and graphs The elimination method for systems of equations The substitution method for systems of equations Systems of linear and quadratic equations Problems leading to systems of equations</p>
<b>2.9. Geometry</b>	2.9.A1.A.	Use algebraic techniques to determine if two lines are parallel and/or perpendicular.	Parallel and perpendicular lines
	2.9.A1.C.	Use techniques from coordinate geometry to establish properties of lines and 2-dimensional shapes and solids.	<p>Coordinate geometry The equation of a straight line The equation of a circle</p>

<p><b>2.10. Trigonometry</b></p>	<p>2.10.A1.A.</p>	<p>Solve problems involving the Pythagorean Theorem.</p>	<p>Introducing the Pythagorean theorem          Finding unknown lengths          Applying the Pythagorean theorem in 2-D          Applying the Pythagorean theorem in space</p>
<p><b>2.11. Concepts of Calculus</b></p>	<p>2.11.A1.B.</p>	<p>Describe rates of change as modeled by linear equations.</p>	<p>Slopes and intercepts          Real life graphs</p>