

**Texas State Core Curriculum**  
**Standards adopted 2007**  
**Algebra I**

Strand	Description	High School Algebra Boardworks presentations
	(1) Foundations for functions. The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to:	
	(A) describe independent and dependent quantities in functional relationships;	Functions and relations
	(B) gather and record data and use data sets to determine functional relationships between quantities;	Non-linear functions
	(C) describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations;	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables
	(D) represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities; and	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables Non-linear functions Graphs of important non-linear functions
	(E) interpret and make decisions, predictions, and critical judgments from functional relationships.	Using graphs to solve equations
	(2) Foundations for functions. The student uses the properties and attributes of functions. The student is expected to:	

(A) identify and sketch the general forms of linear ( $y = x$ ) and quadratic ( $y = x^2$ ) parent functions;	Linear graphs Graphs of important non-linear functions
(B) identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete;	Domain, range and composite functions
(C) interpret situations in terms of given graphs or create situations that fit given graphs; and	Real life graphs
(D) collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.	Scatter plots Lines of best fit
(3) Foundations for functions. The student understands how algebra can be used to express generalizations and recognizes and uses the power of symbols to represent situations. The student is expected to:	
(A) use symbols to represent unknowns and variables; and	Equations, formulas and identities Solving linear equations Equations with parentheses and fractions Using equations to solve problems Substituting into formulas Formula problems Rearranging a formula Manipulating formulas Generating formulas
(B) look for patterns and represent generalizations algebraically.	Sequences and rules Arithmetic sequences Geometric sequences Other types of sequences
(4) Foundations for functions. The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations. The student is expected to:	

(b) Knowledge and skills.

(A) find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations;	<p>Multiplying parentheses  The distributive property  Factoring  Factoring quadratic expressions  Algebraic fractions  Solving linear equations  Equations with parentheses and fractions  Using equations to solve problems  Quadratic equations and factoring</p>
(B) use the commutative, associative, and distributive properties to simplify algebraic expressions; and	<p>Multiplying parentheses  The distributive property  Factoring  Equations involving parentheses and fractions</p>
(C) connect equation notation with function notation, such as $y = x + 1$ and $f(x) = x + 1$ .	Function notation
(5) Linear functions. The student understands that linear functions can be represented in different ways and translates among their various representations. The student is expected to:	
(A) determine whether or not given situations can be represented by linear functions;	<p>Linear graphs  Real life graphs  Non-linear functions</p>
(B) determine the domain and range for linear functions in given situations; and	Domain, range and composite functions
(C) use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions.	Linear graphs
(6) Linear functions. The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to:	
(A) develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations;	Slopes and intercepts
(B) interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs;	Slopes and intercepts

(C) investigate, describe, and predict the effects of changes in $m$ and $b$ on the graph of $y = mx + b$ ;	Slopes and intercepts
(D) graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and $y$ -intercept;	Slopes and intercepts Coordinate geometry The equation of a straight line
(E) determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations;	Slopes and intercepts Coordinate geometry The equation of a straight line
(F) interpret and predict the effects of changing slope and $y$ -intercept in applied situations; and	Slopes and intercepts
(G) relate direct variation to linear functions and solve problems involving proportional change.	Direct proportion Linear graphs Slopes and intercepts
(7) Linear functions. The student formulates equations and inequalities based on linear functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to:	
(A) analyze situations involving linear functions and formulate linear equations or inequalities to solve problems;	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables
(B) investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities; and	Solving linear equations Equations with parentheses and fractions Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Inequalities in two variables

<p>(C) interpret and determine the reasonableness of solutions to linear equations and inequalities.</p>	<p>Solving linear equations  Equations with parentheses and fractions  Using equations to solve problems  Inequalities  Solving linear inequalities  Inequalities and regions  Inequalities in two variables</p>
<p>(8) Linear functions. The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to:</p>	
<p>(A) analyze situations and formulate systems of linear equations in two unknowns to solve problems;</p>	<p>Systems of equations and graphs  The elimination method for systems of equations  The substitution method for systems of equations  Problems leading to systems of equations</p>
<p>(B) solve systems of linear equations using concrete models, graphs, tables, and algebraic methods; and</p>	<p>Systems of equations and graphs  The elimination method for systems of equations  The substitution method for systems of equations  Problems leading to systems of equations</p>
<p>(C) interpret and determine the reasonableness of solutions to systems of linear equations.</p>	<p>Systems of equations and graphs  The elimination method for systems of equations  The substitution method for systems of equations  Problems leading to systems of equations</p>
<p>(9) Quadratic and other nonlinear functions. The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to:</p>	

(A) determine the domain and range for quadratic functions in given situations;	Domain, range and composite functions
(B) investigate, describe, and predict the effects of changes in $a$ on the graph of $y = ax^2 + c$ ;	Graphs of quadratic functions
(C) investigate, describe, and predict the effects of changes in $c$ on the graph of $y = ax^2 + c$ ; and	Graphs of quadratic functions
(D) analyze graphs of quadratic functions and draw conclusions.	Graphs of quadratic functions
(10) Quadratic and other nonlinear functions. The student understands there is more than one way to solve a quadratic equation and solves them using appropriate methods. The student is expected to:	
(A) solve quadratic equations using concrete models, tables, graphs, and algebraic methods; and	Graphs of important non-linear functions Solving quadratic equations Graphs of quadratic functions
(B) make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function.	Solving quadratic equations Graphs of quadratic functions
(11) Quadratic and other nonlinear functions. The student understands there are situations modeled by functions that are neither linear nor quadratic and models the situations. The student is expected to:	
(A) use patterns to generate the laws of exponents and apply them in problem-solving situations;	Exponents Zero, fractional and negative exponents
(B) analyze data and represent situations involving inverse variation using concrete models, tables, graphs, or algebraic methods; and	Inverse proportion
(C) analyze data and represent situations involving exponential growth and decay using concrete models, tables, graphs, or algebraic methods.	Exponentials and logarithms Exponential growth and decay