

# Algebra 1 Parent Guide

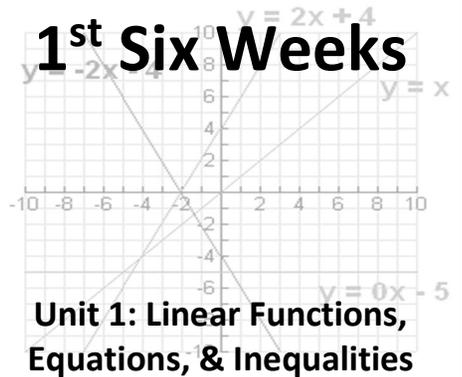
## Unit 1 Concepts:

Linear functions and their related transformations, equations, and solutions.

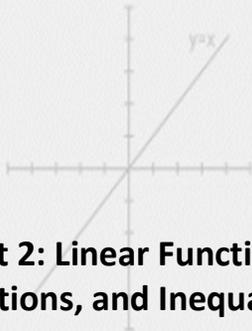
## Learning Goals:

Students will solve multi-step equations involving distribution and variables on both sides. They will also create and solve literal equations and multi-step and compound inequalities. Students will use graphs to relate two quantities and look at patterns involving linear and non-linear functions.

**Why?** – Students will read and analyze graphs and tables, so they are able to determine profits and loss as well as which situation is best given certain conditions. Systems of equations will help determine quantities of items that will allow them to stay within a budget.



## 2<sup>nd</sup> Six Weeks



## Unit 2 Concepts:

Students will write and graph linear functions and equations by studying related topics such as direct variation, parallel and perpendicular lines, and transformations of linear functions. They will solve and graph linear equations and inequalities involving systems of equations & inequalities.

## Learning Goals:

Students will use ratios to show relationships between changing quantities. They will analyze how a line on a graph can be represented by a linear equation in the Slope-Intercept, Point-Slope, and Standard forms. They will learn how relationships between two lines can be determined by comparing their slopes and y-intercepts.

**Why?** – Equations help to predict a company's revenue, the number of days supplies will last on a trip, or the time it will take to complete a project.

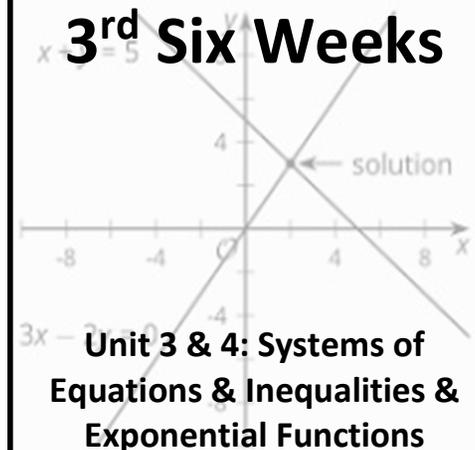
## Unit 3 & 4 Concepts:

Students will apply their previous knowledge of solving & graphing linear equations & inequalities to solving systems of equations & inequalities. They are introduced to more sophisticated techniques for the solution of systems, such as substitution & elimination. Students will also explore exponential functions and equations.

## Learning Goals:

Students will solve systems of linear equations using various methods including substitution, elimination, & matrices with a calculator. They will write, graph, & solve systems of linear inequalities. Additionally, students will understand the basic characteristics of exponential functions, including asymptotes, domain, range, y-intercept, & inequality form. They will solve growth & decay problems, & model real-world data with exponential functions

**Why?** – We use systems to determine break-even points for businesses, calculate airspeeds and groundspeeds or multiple flights, and solve investment account problems. We use exponential functions to show how quantities grow exponentially such as population, compound interest, and charge in a capacitor. Likewise, many quantities decay exponentially over time. The study of exponential functions and equations will help students to make predictions about such situations.



## 4<sup>th</sup> Six Weeks

$$(x+a)(x+b)$$

### Unit 5: Polynomials & Factoring

#### Unit 5 Concepts:

Students will study properties of exponents, including negative exponents, multiplication, and division. They will solve problems that involve factoring binomials, trinomials, and simplifying rational expressions.

#### Learning Goals:

Simplifying numeric and algebraic expressions using laws of exponents will start this unit. Followed by adding, subtracting, and multiplying polynomials. Students will model operations performed with radical expressions, and factor trinomials and polynomials of degree greater than two. They will also learn to divide polynomials.

**Why?** – Exponents can be used to study patterns, make financial forecasts, and help archaeologists estimate the ages of organisms they are studying. Many real-life situations are modeled using polynomials and to find solutions to these problems factoring polynomials is a needed skill.

#### Unit 6 Concepts:

Quadratic functions and equations.

#### Learning Goals:

Students will write quadratic functions in both standard and Vertex Form. They will graph quadratic functions, including transformations of the parent function. Quadratic equations will then be solved using the quadratic formula including finding the number of solutions possible using discriminants.

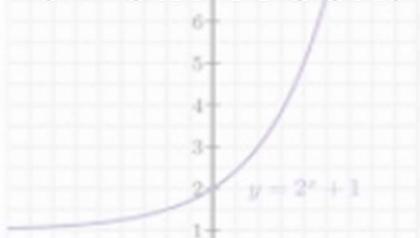
**Why?** – If you shoot an arrow or throw a ball, you may want to know where it will go and how long it will take to get there. You might also need to determine how to price a product you are selling or how many of certain products to produce. Quadratic equations can help in these situations.

## 5<sup>th</sup> Six Weeks

$$ax^2+bx+c=0$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$


### Unit 6: Quadratic Functions & Equations

## 6<sup>th</sup> Six Weeks



### Unit 8: Adding, Subtracting & Multiplying Radicals

#### Unit 8 Concepts:

Manipulating problems that involve radicals. Understanding that radicals are values with fractions as exponents.

#### Learning Goals:

Students will understand that radicals are most often encountered when trying to solve for a variable raised to a fractional power. They will also learn that radicals and taking “the root” of a value is the inverse operation for raising a value to a power.

**Why?** – Radicals are used in everyday life including architecture, technology, and baking. Often radicals are used to calculate distances, understand earthquakes, calculate interest, tune instruments, adjust recipes, and calculate dosages of medications. Students will learn the foundational methods to manipulate radicals so they can apply these skills to the real-world applications they will see in Geometry and Algebra 2.

**Questions?** Please contact your [Algebra 1](#) math teacher. **Additional Support:** We recommend Khan Academy and VarsityTutors.com and remember campus tutoring is also available.