

College Prep Algebra

The following learning targets represent the major concepts studied and assessed in this course.

Unit 1

Linear Functions and Absolute Values and Function Properties

- Write and graph linear equations in slope intercept form ($y= ax+b$) and interpret slope and y-intercept in context (including horizontal and vertical lines).
- Solve linear and absolute value equations using algebraic manipulation.
- Graph and translate absolute value functions using $y=k+f(x-h)$.
- Combine functions and constants to create new functions using addition, subtraction, multiplication.
- Evaluate combinations of functions for given input values.
- Given two functions, compose new functions by inputting one into the other.
- Evaluate a composition of functions for given input values.
- Given a function, write the inverse.
- Determine if two functions are inverses algebraically using composition of functions.
- Graph the inverse of a function and describe its relationship to the original function.

Unit 2

Quadratics

- Graph quadratic functions in vertex, intercept and general forms.
- Find the vertex and axis of symmetry from the equation of a quadratic.
- Identify the x-intercepts of a quadratic written in intercept form.
- Rewrite an equation from vertex or intercept form to general form.
- Understand why setting a quadratic equal to 0 allows solving because of the Zero Product Property.
- Connect solving quadratics in factored form with graphing a quadratic and finding the x-intercepts.
- Solve quadratic equations with real solutions using the quadratic formula.
- Understand what the imaginary number is, why it is needed, and how to simplify expressions using it.
- Simplify square roots of negative numbers using i .
- Solve quadratic equations with imaginary solutions and identify conjugate pairs.

Unit 3

Polynomial Functions

- Given a polynomial, determine the maximum number of x-intercepts and turns.
- Describe the end behavior of a polynomial based on the leading coefficient and the degree of the polynomial.
- Multiply polynomials of any degree and simplify the product.
- Given a factor of a polynomial, find all remaining factors through division.
- Factor a polynomial completely.

Unit 4

Exponential and Logarithmic Functions

- Write exponential functions from a table, graph or description.
- Graph exponential functions and identify the y-intercept, asymptote, domain and range.
- Identify if a function is modeling growth or decay. Updated 2022-23
- Write exponential functions for different growth and decay using a percent rate of change.
- Create and apply a formula for compound interest.
- Explain how the input and output of a logarithm describe an exponential relationship.
- Rewrite exponential equations as logarithmic equations and vice versa.
- Describe a logarithmic function as the inverse function of an exponential function.
- Evaluate logarithmic expressions.
- Use exponents and logarithms to solve equations.
- Graph logarithmic functions and identify the y-intercept, asymptote, domain and range of a logarithmic function.

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Unit 5

Rational Function

- Write and evaluate rational functions.
- Interpret horizontal asymptotes in a real-world context.
- Find the x-intercepts of a rational function by finding the zeros of the numerator.
- Find the vertical asymptotes of a rational function by finding the zeros of the denominator.
- Identify holes in the graph of a rational function.
- Simplify rational functions to lowest terms.
- Add and subtract rational functions.
- Multiply and divide rational functions.
- Solve equations with rational functions using a variety of methods.
- Identify extraneous solutions.

Unit 6

Piecewise Functions

- Interpret and evaluate functions that have different rules for certain intervals of the domain.
- Graph piecewise-defined functions.
- Write equations for piecewise-defined functions given a scenario or a graph.