

Options EHS Applied A 2020	Scope and Sequence
Unit Lesson	Objectives
Extending the Number System	
Function Notation	
	Interpret function notation that models a real-world situation.
	Identify the input and output of a functional relationship, pointing out constraints on the domain and range.
	Use function notation to represent a functional relationship.
Evaluating Functions	
	Analyze a function represented by an equation, table, or graph to determine the output when given the input, and vice versa.
	Find input and output values of two functions graphed in the same coordinate plane.
	Write the inverse of a given linear function.
Literal Equations	
	Rearrange a literal equation to highlight a quantity of interest and use it to solve problems.
Translations of Exponential Functions	
	Graph translations of exponential functions.
	Analyze key aspects of exponential functions that have been translated.
Introduction to Polynomials	
	Identify a polynomial and its equivalent forms.
	Classify a polynomial by degree and number of terms.
Adding and Subtracting Polynomials	
	Add and subtract polynomials, determining the degree and number of terms of the sum or difference.
	Find and evaluate polynomial sums or differences that model real-world situations.

Unit Lesson**Objectives**

Multiplying Monomials and Binomials

Multiply a binomial by a monomial or binomial algebraically and by using geometric models.

Identify a product that results in the difference of squares or a perfect square trinomial.

Multiplying Polynomials and Simplifying Expressions

Multiply a binomial by a trinomial algebraically and by using geometric models.

Interpret the structure of an expression involving addition, subtraction, and multiplication of polynomials in order to write it as a single polynomial in standard form.

Unit Test

Nonlinear Functions

Solving Absolute Value Equations

Solve absolute value equations using tables or algebra, pointing out solutions that are viable or not viable in a modeling context.

Create absolute value equations to model and solve problems.

Absolute Value Inequalities

Rewrite absolute value inequalities as compound inequalities.

Solve absolute value inequalities graphically and algebraically.

Absolute Value Functions and Translations

Graph the absolute value function and its translations.

Analyze key features of the absolute value function and its translations.

Absolute Value Functions and Translations

Graph the absolute value function and its translations.

Unit Lesson**Objectives**

Analyze key features of the absolute value function and its translations.

Unit Test

Polynomial Expressions

Factoring Polynomials: GCF

Determine the greatest common monomial factor of two or more terms.

Write a polynomial as the product of a monomial and polynomial having the same number of terms.

Determine an appropriate way to factor a polynomial for a given context.

Factoring Polynomials: Double Grouping

Factor a polynomial by double grouping or indicate that the polynomial is prime.

Factoring Trinomials: $a = 1$

Determine if a trinomial with a leading coefficient of 1 and a positive constant is factorable and, if so, write it in factored form.

Relate the factorization of a trinomial with a leading coefficient of 1 and a positive constant to a geometric model.

Factoring Trinomials: $a > 1$

Determine if a trinomial with a leading coefficient greater than 1 is factorable and, if so, write it in factored form.

Relate the factorization of a trinomial with a leading coefficient greater than 1 to a geometric model.

Factoring Polynomials: Difference of Squares

Identify a monomial that is a perfect square and find the square root.

Determine if a polynomial is factorable by recognizing that it is a difference of two squares and, if so, applying the identity.

Factoring Polynomials: Sum and Difference of Cubes

Unit Lesson**Objectives**

Identify a monomial that is a perfect cube and find the cube root.

Determine if a polynomial is factorable by recognizing that it is a sum or difference of two cubes and, if so, applying the identity.

Unit Test

Quadratic Functions and Modeling

Introduction to Quadratic Functions

Identify a quadratic function and the values of the coefficients and constant from the standard form.

Evaluate a quadratic function using tables, graphs, and equations.

Calculate the rate of change of a quadratic function over an interval of its domain, and compare it to linear and exponential functions.

Quadratic Functions: Standard Form

Graph a quadratic function given in standard form, identifying the key features of the graph.

Quadratic Functions: Factored Form

Multiply a binomial by a monomial or binomial algebraically and by using geometric models.

Identify a product that results in the difference of squares or a perfect square trinomial.

Quadratic Functions: Vertex Form

Graph a quadratic function given in vertex form, identifying the key features of the graph.

Relate the parameters of a quadratic function in vertex form to transformations of the graph $y = x^2$.

Completing the Square

Relate the geometric model of completing the square to the algebraic process.

Write quadratic functions given in standard form and with $a = 1$ into vertex form by completing the square.

Determine key aspects of the graph of a quadratic function given in standard form and with $a = 1$ by writing it in vertex form.

Relate the parameters of a quadratic function in vertex form to transformations of the graph $y = x^2$.

Unit Lesson**Objectives**

Completing the Square (Continued)

Write quadratic functions given in standard form into vertex form by completing the square.

Determine key aspects of the graph of a quadratic function given in standard form by writing it in vertex form.

Relate the parameters of a quadratic function in vertex form to transformations of the graph $y = x^2$.

Modeling with Quadratic Functions

Write quadratic functions to model problems.

Use quadratic functions to solve mathematical and real-world problems.

Comparing Exponential, Linear, and Quadratic Growth

Use tables and graphs to compare the growth of an exponential function to the growth of a linear function over equal intervals.

Use tables and graphs to compare the growth of an exponential function to the growth of a quadratic or a polynomial function over equal intervals.

Use tables and graphs to show that exponential functions grow by equal factors over equal intervals.

Unit Test

Expressions and Equations: Part One

Solving Quadratic Equations: Zero Product Property

Solve problems by factoring quadratic equations given in standard form.

Write quadratic equations given rational solutions.

Solving Quadratic Equations: Factoring

Write a quadratic equation that models a scenario.

Solve problems by rewriting quadratic equations in standard form and factoring, pointing out the solutions that are viable or not viable in a modeling context.

Unit Lesson**Objectives**

Solving Quadratic Equations: Square Root Property

Use the square root property to solve quadratic equations.

Solving Quadratic Equations: Completing the Square

Solve a quadratic equation whose leading coefficient is 1 by completing the square.

Solving Quadratic Equations: Completing the Square (Continued)

Solve a quadratic equation whose leading coefficient is greater than 1 by completing the square.

Introduction to the Quadratic Formula

Justify the steps used to derive the quadratic formula by completing the square.

Determine the values of a , b , and c from a given quadratic equation in standard form.

Recognize an expression that uses the quadratic formula to find the solutions of a quadratic equation.

Relate the discriminant in the quadratic formula to the types of solutions of a quadratic equation.

Solving Quadratic Equations: Quadratic Formula

Solve a quadratic equation using the quadratic formula.

Determine the number of real zeros of a quadratic function by finding the values of a , b , and c , and then calculating the discriminant.

Modeling with Quadratic Equations

Write and solve quadratic equations to model real-world scenarios, estimating where appropriate and identifying solutions that are not viable in terms of the context.

Unit Test

Expressions and Equations: Part Two

Complex Numbers

Unit Lesson**Objectives**

Represent square roots of negative numbers as multiples of i .

Represent complex numbers in the form $a + bi$ or in the complex plane.

Simplify powers of i using their cyclic nature.

Determine the absolute value of a complex number.

Operations with Complex Numbers

Identify the field properties of complex numbers.

Perform addition, subtraction, and multiplication of complex numbers.

Unit Test

Cumulative Exam

Cumulative Exam Review

Cumulative Exam