## Options EHS Algebra 1B-OR

## Scope and Sequence

## Unit Lesson

## Polynomial Expressions

Introduction to Polynomials

Adding and Subtracting Polynomials

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

Absolute Value Functions and Translations

The Square Root Function

Identify a polynomial and its equivalent forms.
Classify a polynomial by degree and number of terms.

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.

## Objectives

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

Simplify a square root whose radicand is a perfect square.

Graph the square root function and reflections over the axes.

State the domain and range of square root functions.

## Options EHS Algebra 1B-OR

Unit Lesson
The Cube Root Function

Radical Equations

## Exponential Functions

Unit Test

Exponential Growth Functions

Exponential Decay Functions

Linear Growth vs. Exponential Growth

## Scope and Sequence

Objectives

Graph the cube root function, and translations and reflections of it.
State the key features of the cube root function, and translations and reflections of it.

Identify and solve radical equations.
Identify extraneous solutions.

Identify an exponential growth function given tables, graphs, and function rules, determining the rate of change.
Graph an exponential growth function, and state the domain and range.
State the domain and range of an exponential growth function.
Write an exponential growth function to model a real-world problem, pointing out constraints in the modeling context.

Identify an exponential decay function given tables, graphs, and function rules, determining the rate of change.
Graph an exponential decay function, and state the domain and range.
Write an exponential decay function to model a real-world problem, pointing out constraints in the modeling context.

Relate exponential growth and decay functions using laws of exponents and reflections over the $y$-axis.

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

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

## Options EHS Algebra 1B-OR

Unit Lesson
Vertical Stretches and Shrinks of Exponential Functions

Reflections of Exponential Functions
Translations of Exponential Functions

Translations of Exponential Functions

Unit Test

## Quadratic Functions

Introduction to Quadratic Functions

Quadratic Functions: Standard Form

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.

Graph reflections of exponential functions.
Analyze key aspects of exponential functions that have been reflected across an axis.

Graph translations of exponential functions.
Analyze key aspects of exponential functions that have been translated.

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

## Scope and Sequence

## Objectives

Graph a vertically dilated exponential growth or decay function given a table, equation, or scenario.
Determine the parameters and create an equation for a vertically dilated exponential growth or decay function given a table, equation, or scenario.

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: Vertex Form

## Options EHS Algebra 1B-OR

## Unit Lesson

Completing the Square

## Scope and Sequence

Objectives
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 $y=x 2$.

Relate the geometric model of completing the square to the algebraic process.
Write quadratic functions given in standard form and with $\mathrm{a}=1$ 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 $\mathrm{y}=\mathrm{x} 2$.
Unit Test

## Quadratic Equations

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.

Solving Quadratic Equations: Square
Root Property

Solving Quadratic Equations:
Completing the Square

Use the square root property to solve quadratic equations.

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

## Options EHS Algebra 1B-OR

## Scope and Sequence

Unit Lesson
Objectives
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
Modeling with Quadratic Equations

Solve a quadratic equation using the quadratic formula.
Determine the number of real zeros of a quadratic function by finding the values of $a, b, a n d c$, and then calculating the discriminant.

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.

Solve a system of equations consisting of a line and a parabola algebraically and graphically, using technology where appropriate.

Unit Test

## Data Analysis

Describing Data

Identify various data collection methods and analyze various displays of data
Determine if a sample fairly represents the population as a whole or if there is bias.
Informally describe the shape, center, and variability of a distribution based on a dot plot, histogram, or box

| Options EHS Algebra 1B-OR | Scope and Sequence |
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| Unit Lesson | Objectives |
| Two-Way Tables |  |
|  | Display data in a two-way frequency table given a scenario or Venn diagram, and identify joint and marginal <br> frequencies. |
|  | Calculate relative frequencies and display them in a two-way relative frequency table. |
| Interpret joint and marginal relative frequencies in the context of the data. |  |

## Page 6 of 9

Options EHS Algebra 1B-OR
Unit Lesson

Measures of Variability

Standard Deviation

## Box Plots

Describing and Comparing Data with Dotplots and Stemplots Histograms

## Scope and Sequence

Objectives
et Interpret the range, standard deviation, or interquartile range of a univariate data set.

Compare the spread given graphical displays of two univariate data sets.
Use a graphing calculator to compute the numerical summary of a univariate data set.

Calculate variance and standard deviation for a given data set.
Analyze histograms for skewness and symmetry.
Analyze a normal distribution curve to determine statistical measures.

Create and interpret box plots.
Analyze box plots for symmetry and outliers.
Compare box plots.

Identify and/or describe a dotplot.
Identify and/or describe a stemplot.
Compare two distributions using dotplots or stemplots.

Identify the patterns, shape, and spread of a distribution using histograms.
Relate measures of center to the shape of a distribution using histograms.

Options EHS Algebra 1B-OR

## Scope and Sequence

Unit Lesson
Objectives
Compare two distributions using histograms.
Test

## Linear Regression

Line of Best Fit

Analyzing Residuals

Strength of Correlation

Regression Models context.

Use a line of best fit to make a prediction.

Compute the residuals for a set of data and a line of best fit.
Determine the residual plot for a given scatterplot and line of best fit.

Calculate the correlation coefficient for a linear model using technology.

Analyze data to draw conclusions about correlation and causation.

Determine if a data set shows a correlation and, if so, the type of correlation.
Use technology to determine the line of best fit for a data set, and interpret the parameters of the model in

Determine if a given linear function is a reasonable model for a set of data arising from a real-world situation

Analyze the residual plot to determine whether the function is an appropriate fit for a linear model.

Interpret the strength of a linear model based on the correlation coefficient.

Determine an exponential, quadratic, or linear model for a given data set using technology.
Identify limitations of models in real-world contexts.
Use a linear, quadratic, or exponential regression model to make a prediction.
Interpret the graph of a regression model in the context of the problem.

Test

## Page 8 of 9

Cumulative Exam
Cumulative Exam Review
Cumulative Exam

