

## Algebra 1 and Prep for Algebra 1 Combined

This course covers the topics shown below.

Students navigate learning paths based on their level of readiness.

Institutional users may customize the scope and sequence to meet curricular needs.

Curriculum (578 topics + 756 additional topics)

- Whole Numbers (60 topics)
  - Addition (9 topics)
    - One-digit addition with regrouping
    - Adding 2-digit numbers without regrouping
    - Adding a 2-digit number and a 1-digit number with regrouping
    - Adding 2-digit numbers with regrouping a ten
    - Adding multiples of 10 and 100
    - Adding 2-digit numbers with regrouping a hundred
    - Adding 3 or 4 numbers with two-digits with regrouping
    - Adding 3-digit numbers with regrouping
    - Adding 3 numbers with two, three, and four-digits
  - Subtraction (11 topics)
    - Subtracting a 1-digit number from a 2-digit number
    - Subtraction of 2-digit numbers without regrouping
    - Subtracting multiples of 10 and 100
    - Subtraction involving 3-digit numbers without regrouping
    - Subtraction of 2-digit numbers with regrouping
    - Subtraction with multiple regrouping steps involving 3-digit numbers
    - Addition or subtraction with 10, 100, or 1000
    - Subtraction with multiple regrouping steps involving 4-digit numbers
    - Subtraction and regrouping with zeros
    - Word problem with addition or subtraction of whole numbers
    - Describing an increasing or decreasing pattern from a table of values
  - Multiplication (14 topics)
    - Multiplying a 1-digit number by 6, 7, 8, or 9
    - Rewriting a repeated addition as a multiplication sentence
    - Using multiplication to find the number of squares in an array
    - Multiplying a 1-digit number by 10, 100, or 1,000
    - Multiplying 2-digit and 1-digit numbers without regrouping
    - Understanding multiplication of a 1-digit number by a multiple of 10
    - Multiplying a 1-digit number by a multiple of 100 or 1,000
    - Multiplying 2-digit and 1-digit numbers with regrouping: Digits up to 9
    - Multiplying multi-digit and 1-digit numbers with regrouping
    - Introduction to multiplication of large numbers
    - Multiplication of large numbers
    - Multiplication with trailing zeros: Problem type 2
    - Finding multiples of 2, 5, or 10
    - Finding multiples of 3, 4, 6, 7, 8, or 9
  - Division (15 topics)
    - Completing division facts: Divisors 6-9
    - Division of whole numbers given in fractional form
    - Division involving zero
    - Division without regrouping
    - Division with regrouping: 1-digit divisor, 2-digit dividend
    - Quotient with remainder: 1-digit divisor, 2-digit dividend
    - Whole number division: 2-digit by 2-digit, no remainder
    - Solving a word problem with multiplication or division: Up to 2-digit numbers
    - Word problem with multiplication and addition or subtraction of whole numbers
    - Word problem on unit rates associated with ratios of whole numbers: Whole number answers
    - Division with trailing zeros: Problem type 1
    - Division with regrouping: 1-digit divisor, 3-digit or 4-digit dividend
    - Quotient with remainder: 1-digit divisor, 3-digit or 4-digit dividend
    - Division with trailing zeros: Problem type 2
    - Whole number division: 3-digit by 2-digit, no remainder
  - Ordering and Estimation (4 topics)
    - Whole number place value: Problem type 1
    - Introduction to inequalities
    - Ordering large numbers

- Rounding to hundreds or thousands
- Exponents and Order of Operations (5 topics)
  - Introduction to exponents
  - Introduction to parentheses
  - Introduction to order of operations
  - Order of operations with whole numbers
  - Order of operations with whole numbers and exponents: Basic
- Factors and Multiples (2 topics)
  - Even and odd numbers
  - Greatest common factor of 2 numbers
- Fractions (20 topics)
  - Equivalent Fractions (7 topics)
    - Understanding non-unit fractions
    - Expressing whole numbers as fractions
    - Introduction to finding equivalent fractions: Multiplying
    - Introduction to finding equivalent fractions: Dividing
    - Equivalent fractions
    - Introduction to simplifying a fraction
    - Simplifying a fraction
  - Plotting and Ordering (3 topics)
    - Comparing fractions with the same denominator
    - Ordering fractions with the same numerator
    - Comparing fractions by finding a common denominator
  - Addition and Subtraction with Fractions (4 topics)
    - Addition or subtraction of fractions with the same denominator and simplification
    - Writing unit fractions with a common denominator to add or subtract
    - Writing fractions with a common denominator to add or subtract
    - Addition or subtraction of fractions with different denominators
  - Multiplication and Division with Fractions (6 topics)
    - Product of a unit fraction and a whole number
    - Product of a fraction and a whole number: Problem type 1
    - Product of a fraction and a whole number: Problem type 2
    - Introduction to fraction multiplication
    - Fraction multiplication
    - Division involving a whole number and a unit fraction
- Decimals and Percents (36 topics)
  - Place Value and Ordering (1 topics)
    - Rounding decimals
  - Converting Decimals to Fractions (2 topics)
    - Converting a decimal to a proper fraction without simplifying: Basic
    - Converting a decimal to a mixed number and an improper fraction without simplifying
  - Addition and Subtraction with Decimals (5 topics)
    - Addition of decimals: Vertically aligned
    - Decimal addition with 2 numbers
    - Decimal subtraction: Basic
    - Word problem with addition or subtraction of 2 decimals
    - Word problem with subtraction of a whole number and a decimal: Regrouping with zeros
  - Multiplication and Division with Decimals (11 topics)
    - Multiplication of a decimal by a power of ten
    - Multiplying a decimal less than 1 by a whole number
    - Multiplying a decimal by a whole number
    - Multiplying decimals less than 1: Problem type 1
    - Decimal multiplication: Problem type 1
    - Word problem with multiplication of a decimal and a whole number
    - Word problem with multiple decimal operations: Problem type 1
    - Division of a decimal by a power of ten
    - Whole number division with decimal answers
    - Division of a decimal by a whole number
    - Word problem with division of a decimal and a whole number
  - Converting Fractions to Decimals (3 topics)
    - Converting a fraction with a denominator of 10 or 100 to a decimal
    - Converting a proper fraction with a denominator of 2, 4, or 5 to a decimal

- Converting a fraction to a terminating decimal: Basic
- Ratios and Unit Rates (2 topics)
  - Finding missing values in a table expressing a constant rate
  - Solving a word problem on proportions using a unit rate
- Percents, Decimals, and Fractions (6 topics)
  - Converting a fraction with a denominator of 100 to a percentage
  - Introduction to converting a percentage to a decimal
  - Introduction to converting a decimal to a percentage
  - Converting between percentages and decimals
  - Converting a fraction to a percentage: Denominator of 4, 5, or 10
  - Converting a fraction to a percentage in a real-world situation
- Introduction to Percent Applications (1 topics)
  - Finding a percentage of a whole number without a calculator: Basic
- Units of Measurement (5 topics)
  - U.S. Customary length conversion with whole number values
  - U.S. Customary volume conversion with whole number values
  - U.S. Customary weight conversions with whole number values
  - Time unit conversion with whole number values
  - Converting between metric and U.S. Customary unit systems
- Real Numbers (56 topics)
  - Plotting and Ordering (6 topics)
    - Plotting integers on a number line
    - Ordering integers
    - Writing a signed number for a real-world situation
    - Square root of a perfect square
    - Using a calculator to approximate a square root
    - Absolute value of a number
  - Operations with Integers (10 topics)
    - Integer addition: Problem type 1
    - Integer addition: Problem type 2
    - Integer subtraction: Problem type 1
    - Integer subtraction: Problem type 2
    - Integer subtraction: Problem type 3
    - Addition and subtraction with 3 integers
    - Operations with absolute value: Problem type 1
    - Computing the distance between two integers on a number line
    - Integer multiplication and division
    - Multiplication of 3 or 4 integers
  - Operations with Signed Fractions and Decimals (3 topics)
    - Signed fraction addition or subtraction: Basic
    - Signed fraction multiplication: Basic
    - Signed decimal addition and subtraction
  - Exponents and Order of Operations (4 topics)
    - Exponents and integers: Problem type 1
    - Exponents and fractions
    - Exponents and signed fractions
    - Order of operations with integers
  - Evaluating Expressions (5 topics)
    - Evaluating an algebraic expression: Whole numbers with two operations
    - Evaluating a formula
    - Evaluating an algebraic expression: Whole numbers with one operation and an exponent
    - Evaluating a linear expression: Integer multiplication with addition or subtraction
    - Evaluating a quadratic expression: Integers
  - One-Step Linear Equations (12 topics)
    - Identifying solutions to a one-step linear equation: Problem type 1
    - Identifying solutions to a one-step linear equation: Problem type 2
    - Additive property of equality with whole numbers
    - Additive property of equality with decimals
    - Additive property of equality with integers
    - Additive property of equality with signed fractions
    - Writing an equation and solving a multiplicative comparison word problem
    - Multiplicative property of equality with whole numbers
    - Multiplicative property of equality with fractions
    - Multiplicative property of equality with decimals

- Multiplicative property of equality with integers
- Multiplicative property of equality with signed fractions
- Properties of Operations (11 topics)
  - Combining like terms: Whole number coefficients
  - Combining like terms: Integer coefficients
  - Combining like terms: Decimal coefficients
  - Multiplying a constant and a linear monomial
  - Distributive property: Whole number coefficients
  - Distributive property: Integer coefficients
  - Factoring a linear binomial
  - Identifying parts in an algebraic expression
  - Identifying equivalent algebraic expressions
  - Using distribution and combining like terms to simplify: Univariate
  - Combining like terms in a quadratic expression
- Introduction to Perimeter, Area, and Volume (5 topics)
  - Perimeter of a square or a rectangle
  - Writing algebraic expressions for the perimeter of a figure
  - Area of a square or a rectangle
  - Writing algebraic expressions for the area of a figure
  - Volume of a rectangular prism
- Linear Equations (51 topics)
  - Multi-Step Linear Equations (17 topics)
    - Identifying solutions to a linear equation in one variable: Two-step equations
    - Using two steps to solve an equation with whole numbers
    - Additive property of equality with a negative coefficient
    - Solving a two-step equation with integers
    - Introduction to using substitution to solve a linear equation
    - Introduction to solving an equation with parentheses
    - Solving a multi-step equation given in fractional form
    - Solving a two-step equation with signed decimals
    - Identifying properties used to solve a linear equation
    - Introduction to solving an equation with variables on the same side
    - Solving a linear equation with several occurrences of the variable: Variables on the same side
    - Introduction to solving a linear equation with a variable on each side
    - Solving a linear equation with several occurrences of the variable: Variables on both sides
    - Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
    - Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
    - Solving a two-step equation with signed fractions
    - Solving equations with zero, one, or infinitely many solutions
  - Writing Expressions and Equations (6 topics)
    - Writing a one-step expression for a real-world situation
    - Translating a phrase into a one-step expression
    - Translating a phrase into a two-step expression
    - Translating a sentence into a one-step equation
    - Writing an equation to represent a proportional relationship
    - Translating a sentence into a multi-step equation
  - Applications of Linear Equations (8 topics)
    - Writing and solving a one-step equation with decimals that models a real-world situation
    - Writing an equation of the form  $Ax + B = C$  to solve a word problem
    - Solving a decimal word problem using a linear equation of the form  $Ax + B = C$
    - Solving a word problem with two unknowns using a linear equation
    - Writing an equation to represent a real-world problem: Variable on both sides
    - Solving a one-step word problem using the formula  $d = rt$
    - Finding side lengths of rectangles given one dimension and an area or a perimeter
    - Finding the dimensions of a rectangle given its perimeter and a relationship between sides
  - Solving for a Variable and Dimensional Analysis (7 topics)
    - Solving for a variable in terms of other variables using addition or subtraction: Basic
    - Solving for a variable in terms of other variables using multiplication or division: Basic
    - Solving for a variable in terms of other variables using addition or subtraction with division
    - Solving for a variable inside parentheses in terms of other variables
    - Solving for a variable in terms of other variables in a linear equation with fractions
    - U.S. Customary length conversions involving dimensional analysis
    - Converting between compound units: Basic
  - Proportions (5 topics)
    - Solving a proportion of the form  $x/a = b/c$ : Basic
    - Solving a proportion of the form  $x/a = b/c$
    - Writing a proportion to solve a problem involving rates

- Writing and solving a proportion to convert between metric and U.S. Customary units
- Word problem on proportions: Problem type 1
- More on Percents (8 topics)
  - Applying the percent equation: Problem type 1
  - Writing a proportion to solve a multi-step problem involving percentages
  - Finding the multiplier to give a final amount after a percentage increase or decrease
  - Finding the final amount given the original amount and a percentage increase or decrease
  - Finding the sale price given the original price and percent discount
  - Finding the percentage increase or decrease: Advanced
  - Finding the absolute error and percent error of a measurement
  - Introduction to compound interest
- Linear Inequalities (29 topics)
  - Writing and Graphing Inequalities (6 topics)
    - Translating a sentence by using an inequality symbol
    - Translating a sentence into a one-step inequality
    - Introduction to identifying solutions to an inequality
    - Writing an inequality for a real-world situation
    - Graphing a linear inequality on the number line
    - Writing an inequality given a graph on the number line
  - One-Step Linear Inequalities (6 topics)
    - Identifying solutions to a one-step linear inequality
    - Additive property of inequality with whole numbers
    - Additive property of inequality with integers
    - Multiplicative property of inequality with whole numbers
    - Multiplicative property of inequality with integers
    - Multiplicative property of inequality with signed fractions
  - Multi-Step Linear Inequalities (8 topics)
    - Identifying solutions to a two-step linear inequality in one variable
    - Solving a two-step linear inequality with whole numbers
    - Solving a two-step linear inequality: Problem type 1
    - Solving a two-step linear inequality: Problem type 2
    - Solving a two-step linear inequality with a fractional coefficient
    - Solving a linear inequality with multiple occurrences of the variable: Problem type 1
    - Solving a linear inequality with multiple occurrences of the variable: Problem type 2
    - Solving inequalities with no solution or all real numbers as solutions
  - Applications (4 topics)
    - Writing, solving, and graphing the solution to a one-step inequality that models a real-world situation
    - Solving a word problem using a one-step linear inequality
    - Solving a word problem using a two-step linear inequality
    - Solving a decimal word problem using a two-step linear inequality
  - Compound Inequalities (4 topics)
    - Translating a sentence into a compound inequality
    - Graphing a compound inequality on the number line
    - Solving a compound linear inequality: Graph solution, basic
    - Solving and graphing the solution to a compound inequality that models a real-world situation
  - Absolute Value Inequalities (1 topics)
    - Writing and solving an absolute value inequality that models a real-world situation and interpreting the solution
- Functions and Lines (129 topics)
  - Ordered Pairs (7 topics)
    - Reading a point in quadrant 1
    - Plotting a point in quadrant 1
    - Reading a point in the coordinate plane
    - Plotting a point in the coordinate plane
    - Finding distances between points that share a common coordinate given the graph
    - Finding the perimeter or area of a rectangle in the coordinate plane
    - Finding the area of a triangle or parallelogram in the coordinate plane
  - Tables and Graphs of Lines (17 topics)
    - Function tables with two-step rules
    - Table for a linear equation
    - Writing a function rule given a table of ordered pairs: One-step rules
    - Identifying solutions to a linear equation in two variables
    - Finding the coordinates of a point on a graph given the equation
    - Finding a solution to a linear equation in two variables
    - Graphing a line in quadrant 1

- Graphing a linear equation of the form  $y = mx$
- Graphing a line given its equation in slope-intercept form: Integer slope
- Graphing a line given its equation in slope-intercept form: Fractional slope
- Graphing a line given its equation in standard form
- Graphing a vertical or horizontal line
- Finding x- and y-intercepts given the graph of a line on a grid
- Finding x- and y-intercepts of a line given the equation: Basic
- Graphing a line by first finding its x- and y-intercepts
- Identifying parallel and perpendicular lines
- Interpreting a line graph
- Slope (7 topics)
  - Finding slope given the graph of a line in quadrant 1 that models a real-world situation
  - Classifying slopes given graphs of lines
  - Finding slope given the graph of a line on a grid
  - Finding slope given two points on a line
  - Finding the slopes of horizontal and vertical lines
  - Graphing a line given its slope and y-intercept
  - Graphing a line through a given point with a given slope
- Direct and Inverse Variation (9 topics)
  - Identifying direct variation equations
  - Identifying direct variation from ordered pairs and writing equations
  - Writing a direct variation equation
  - Word problem on direct variation
  - Interpreting direct variation from a graph
  - Writing an inverse variation equation
  - Identifying direct and inverse variation equations
  - Identifying direct and inverse variation from ordered pairs and writing equations
  - Word problem on inverse variation
- Equations of Lines (19 topics)
  - Identifying linear functions given ordered pairs
  - Rewriting a linear equation in the form  $Ax + By = C$
  - Finding the slope and y-intercept of a line given its equation in the form  $y = mx + b$
  - Finding the slope and y-intercept of a line given its equation in the form  $Ax + By = C$
  - Graphing a line by first finding its slope and y-intercept
  - Writing an equation of a line given its slope and y-intercept
  - Finding the slope and y-intercept given a table for a linear function
  - Finding the slope, y-intercept, and equation for a linear function given a table of values
  - Writing an equation in slope-intercept form given the slope and a point
  - Finding the slope and a point on a line given its equation in point-slope form
  - Writing the equation of a line in point-slope form given the slope and a point
  - Writing the equation of a line in standard form given the slope and a point
  - Writing the equation of a line given the y-intercept and another point
  - Writing the equation of a line through two given points
  - Writing the equation and finding the slope of a line parallel or perpendicular to a vertical or horizontal line
  - Comparing linear functions to the parent function  $y = x$
  - Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
  - Finding slopes of lines parallel and perpendicular to a line given in the form  $Ax + By = C$
  - Writing equations of lines parallel and perpendicular to a given line through a point
- Applications of Linear Equations with Two Variables (14 topics)
  - Finding outputs of a one-step function that models a real-world situation: Two variable equation
  - Finding outputs of a two-step function with decimals that models a real-world situation: Two variable equation
  - Writing and evaluating a function that models a real-world situation: Basic
  - Writing a linear equation that models a real-world situation given a graph or a table of values
  - Writing an equation and drawing its graph to model a real-world situation: Advanced
  - Finding the intercepts and rate of change given a graph of a linear function
  - Finding the initial amount and rate of change given a table for a linear function
  - Finding the initial amount and rate of change given two points for a linear function
  - Combining functions to write a new function that models a real-world situation
  - Comparing properties of linear functions given in different forms
  - Interpreting the parameters of a linear function that models a real-world situation
  - Application problem with a linear function: Finding a coordinate given the slope and a point
  - Application problem with a linear function: Finding a coordinate given two points
  - Solving a linear equation by graphing
- Scatter Plots and Lines of Best Fit (10 topics)
  - Constructing a scatter plot
  - Sketching the line of best fit
  - Scatter plots and correlation
  - Predictions from the line of best fit
  - Approximating the equation of a line of best fit and making predictions

- Using technology to fit a linear regression model to data and to make a prediction
- Computing residuals
- Interpreting residual plots
- Linear relationship and the correlation coefficient
- Identifying correlation and causation
- Introduction to Functions (9 topics)
  - Identifying functions from relations
  - Vertical line test
  - Domain and range from ordered pairs
  - Table for a linear function
  - Evaluating functions: Linear and quadratic or cubic
  - Evaluating a piecewise-defined function
  - Finding outputs of a two-step function with decimals that models a real-world situation: Function notation
  - Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
  - Domain and range of a linear function that models a real-world situation
- Arithmetic Sequences (9 topics)
  - Finding the first terms of an arithmetic sequence using an explicit rule
  - Finding the next terms of an arithmetic sequence with whole numbers
  - Finding the next terms of an arithmetic sequence with integers
  - Finding the first terms of a sequence using a recursive rule
  - Identifying arithmetic sequences and finding the common difference
  - Finding a specified term of an arithmetic sequence given the first terms
  - Finding a specified term of an arithmetic sequence given the common difference and first term
  - Writing an explicit rule for an arithmetic sequence
  - Writing a recursive rule for an arithmetic sequence
- Graphs of Functions (20 topics)
  - Finding an output of a function from its graph
  - Finding and interpreting an output of a linear function given a graph that models a real-world situation
  - Domain and range from the graph of a discrete relation
  - Finding domain and range from a linear graph in context
  - Interpreting the domain and range of a linear function in context
  - Finding where a function is increasing, decreasing, or constant given the graph
  - Choosing a graph to fit a narrative: Basic
  - Choosing a graph to fit a narrative: Advanced
  - Drawing a graph to fit a narrative
  - Graphing an absolute value equation of the form  $y = A|x|$
  - Graphing an absolute value equation in the plane: Basic
  - Determining if a function is linear given its graph
  - Graphing a parabola of the form  $y = ax^2$
  - Graphing a parabola of the form  $y = (x-h)^2 + k$
  - Graphing a piecewise-defined function: Problem type 1
  - Introduction to graphing a piecewise-defined function involving lines with non-zero slope
  - Graphing a piecewise-defined function: Problem type 2
  - Finding the average rate of change of a function given its equation
  - Finding the average rate of change of a function given its graph
  - Word problem involving average rate of change
- Transformations (8 topics)
  - Translating the graph of a parabola: One step
  - Translating the graph of a parabola: Two steps
  - How the leading coefficient affects the shape of a parabola
  - Graphing quadratic functions of the form  $y=ax^2$  and  $y=(bx)^2$  by transforming the parent graph  $y=x^2$
  - Translating the graph of an absolute value function: One step
  - Translating the graph of an absolute value function: Two steps
  - How the leading coefficient affects the graph of an absolute value function
  - Writing an equation for a function after a vertical translation
- Systems of Linear Equations and Inequalities (31 topics)
  - Graphing Systems of Equations (8 topics)
    - Identifying solutions to a system of linear equations
    - Identifying the solution of systems of linear equations from graphs
    - Classifying systems of linear equations from graphs
    - Graphically solving a system of linear equations both of the form  $y=mx+b$
    - Graphing a system of linear equations and estimating a solution
    - Graphically solving a system of linear equations
    - Using a graphing calculator to solve a system of linear equations: Basic
    - Writing a system of linear equations given its graph
  - Substitution and Elimination Method (6 topics)
    - Solving a system of linear equations of the form  $y = mx + b$
    - Solving a system of linear equations using substitution

- Solving a system of linear equations using elimination with addition
- Solving a system of linear equations using elimination with multiplication and addition
- Solving systems of linear equations with 0, 1, or infinitely many solutions
- Identifying the operations used to create equivalent systems of equations
- Applications and Matrices (6 topics)
  - Interpreting the graphs of two functions
  - Solving a word problem involving a sum and another basic relationship using a system of linear equations
  - Writing and solving a system of two linear equations given a table of values
  - Solving a word problem using a system of linear equations of the form  $y = mx + b$
  - Solving a value mixture problem using a system of linear equations
  - Solving a distance, rate, time problem using a system of linear equations
- Linear Inequalities with Two Variables (6 topics)
  - Identifying solutions to a linear inequality in two variables
  - Graphing a linear inequality in the plane: Vertical or horizontal line
  - Graphing a linear inequality in the plane: Slope-intercept form
  - Graphing a linear inequality in the plane: Standard form
  - Writing an inequality given its graph in the plane: Horizontal or vertical boundary line
  - Writing an inequality given its graph in the plane: Slanted boundary line
- Systems of Linear Inequalities (5 topics)
  - Graphing a system of two linear inequalities: Basic
  - Graphing a system of two linear inequalities: Advanced
  - Writing a linear inequality in two variables given a table of values
  - Writing a multi-step inequality for a real-world situation
  - Writing a system of linear inequalities that models a real-world situation and determining possible solutions
- Exponents and Exponential Functions (68 topics)
  - Product, Power, and Quotient Rules (15 topics)
    - Introduction to the product rule with positive exponents: Whole number base
    - Introduction to the product rule of exponents
    - Product rule with positive exponents: Univariate
    - Product rule with positive exponents: Multivariate
    - Introduction to the power of a power rule with positive exponents: Whole number base
    - Introduction to the power of a power rule of exponents
    - Introduction to the power of a product rule of exponents
    - Power rules with positive exponents: Multivariate products
    - Power rules with positive exponents: Multivariate quotients
    - Simplifying a ratio of multivariate monomials: Basic
    - Introduction to the quotient rule of exponents
    - Simplifying a ratio of univariate monomials
    - Quotient of expressions involving exponents
    - Simplifying a ratio of multivariate monomials: Advanced
    - Power and quotient rules with positive exponents
  - Negative Exponents (11 topics)
    - Evaluating expressions with exponents of zero
    - Evaluating an expression with a negative exponent: Whole number base
    - Evaluating an expression with a negative exponent: Positive fraction base
    - Evaluating an expression with a negative exponent: Negative integer base
    - Rewriting an algebraic expression without a negative exponent
    - Introduction to the product rule with negative exponents
    - Quotient rule with negative exponents: Problem type 1
    - Quotient rule with negative exponents: Problem type 2
    - Power of a power rule with negative exponents
    - Power rules with negative exponents
    - Power and quotient rules with negative exponents: Problem type 1
  - Introduction to Radicals (8 topics)
    - Square root of a rational perfect square
    - Square roots of perfect squares with signs
    - Cube root of an integer
    - Simplifying the square root of a whole number less than 100
    - Simplifying the square root of a whole number greater than 100
    - Introduction to square root addition or subtraction
    - Introduction to square root multiplication
    - Classifying sums and products as rational or irrational
  - Rational Exponents (7 topics)
    - Converting between radical form and exponent form
    - Using the properties of integer exponents to define rational exponents
    - Rational exponents: Unit fraction exponents and whole number bases
    - Rational exponents: Non-unit fraction exponent with a whole number base

- Rational exponents: Product rule
- Rational exponents: Quotient rule
- Rational exponents: Power of a power rule
- Graphs of Exponential Functions (7 topics)
  - Table for an exponential function
  - Graphing an exponential function:  $f(x) = b^x$
  - Graphing an exponential function:  $f(x) = a(b)^x$
  - Translating the graph of an exponential function
  - Finding domain and range from the graph of an exponential function
  - Finding the domain and range from the graph of an exponential function: Symbolic notation
  - Choosing the graph for an exponential function and identifying key features
- Applications (11 topics)
  - Using a calculator to evaluate exponential expressions
  - Evaluating an exponential function that models a real-world situation
  - Finding a final amount in a word problem on exponential growth or decay
  - Finding the initial amount and rate of change given an exponential function
  - Writing an equation that models exponential growth or decay
  - Writing an exponential function rule given a table of ordered pairs
  - Finding the initial amount and asymptote given a graph of an exponential function
  - Choosing an exponential model and using it to make a prediction
    - Using technology to determine the better regression model for a given data set and using that model to make a prediction: Linear and exponential
  - Finding the final amount in a word problem on compound interest
  - Comparing linear, polynomial, and exponential functions
- Geometric Sequences (9 topics)
  - Finding the first terms of a geometric sequence using an explicit rule
  - Finding the next terms of a geometric sequence with whole numbers
  - Finding the next terms of a geometric sequence with signed numbers
  - Identifying geometric sequences and finding the common ratio
  - Finding a specified term of a geometric sequence given the first terms
  - Finding a specified term of a geometric sequence given the common ratio and first term
  - Arithmetic and geometric sequences: Identifying and writing an explicit rule
  - Writing recursive rules for arithmetic and geometric sequences
  - Identifying linear, quadratic, and exponential functions given ordered pairs
- Polynomials and Factoring (25 topics)
  - Polynomial Addition and Subtraction (2 topics)
    - Degree and leading coefficient of a univariate polynomial
    - Simplifying a sum or difference of two univariate polynomials
  - Polynomial Multiplication (8 topics)
    - Multiplying a univariate polynomial by a monomial with a positive coefficient
    - Multiplying binomials with leading coefficients of 1
    - Multiplying binomials with leading coefficients greater than 1
    - Multiplying binomials in two variables
    - Multiplying conjugate binomials: Univariate
    - Squaring a binomial: Univariate
    - Multiplying binomials with negative coefficients
    - Multiplication involving binomials and trinomials in one variable
  - Factoring Using the GCF (2 topics)
    - Introduction to the GCF of two monomials
    - Factoring out a monomial from a polynomial: Univariate
  - Factoring by Grouping (2 topics)
    - Factoring a univariate polynomial by grouping: Problem type 1
    - Factoring a univariate polynomial by grouping: Problem type 2
  - Factoring Quadratic Trinomials (5 topics)
    - Factoring a quadratic with leading coefficient 1
    - Factoring out a constant before factoring a quadratic
    - Factoring a quadratic with leading coefficient greater than 1: Problem type 1
    - Factoring a quadratic with leading coefficient greater than 1: Problem type 2
    - Factoring a quadratic with a negative leading coefficient
  - Factoring Special Products (5 topics)
    - Factoring a perfect square trinomial with leading coefficient 1
    - Factoring a perfect square trinomial with leading coefficient greater than 1
    - Factoring a difference of squares in one variable: Basic
    - Factoring a difference of squares in one variable: Advanced
    - Factoring a polynomial involving a GCF and a difference of squares: Univariate

- Polynomial Division (1 topics)
  - Closure properties of integers and polynomials
- Quadratic Functions and Equations (45 topics)
  - Solving Quadratic Equations by Factoring (6 topics)
    - Solving an equation written in factored form
    - Finding the roots of a quadratic equation of the form  $ax^2 + bx = 0$
    - Finding the roots of a quadratic equation with leading coefficient 1
    - Finding the roots of a quadratic equation with leading coefficient greater than 1
    - Solving a word problem using a quadratic equation with rational roots
    - Writing and solving a quadratic equation for a real-world problem involving area or volume
  - Quadratic Functions (27 topics)
    - Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
    - Graphing a parabola of the form  $y = a(x-h)^2 + k$
    - Completing the square
    - Graphing a parabola of the form  $y = x^2 + bx + c$
    - Graphing a parabola of the form  $y = ax^2 + bx + c$ : Integer coefficients
    - Finding the zeros of a quadratic function given its equation
    - Writing a quadratic function given its zeros
    - Finding the x-intercept(s) and the vertex of a parabola
    - Using a graphing calculator to find the x-intercept(s) and vertex of a quadratic function
    - Writing the equation of a quadratic function given a real-world description
    - Rewriting a quadratic function in standard form
    - Rewriting a quadratic function to find its vertex and sketch its graph
    - Rewriting a quadratic function to find its maximum or minimum and axis of symmetry
    - Finding the maximum or minimum of a quadratic function
    - Word problem involving the maximum or minimum of a quadratic function
    - Finding the domain and range from the graph of a parabola
    - Finding the domain and range from the graph of a parabola: Symbolic notation
    - Graphing a quadratic function that models a real-world situation and identifying key features
    - Writing the equation of a quadratic function given a table of values
    - Writing the equation of a quadratic function given its x-intercepts and another point
    - Writing the equation of a quadratic function given its graph
    - Solving a quadratic equation by graphing
    - Comparing properties of quadratic functions given in different forms
    - Classifying the graph of a function
    - Comparing linear, quadratic, and exponential functions given in different forms
    - Choosing a quadratic model and using it to make a prediction
      - Using technology to determine the better regression model for a given data set and using that model to make a prediction: Exponential and quadratic
  - Square Root Property (3 topics)
    - Solving an equation of the form  $x^2 = a$  using the square root property
    - Solving a quadratic equation using the square root property: Decimal answers, basic
    - Solving a quadratic equation using the square root property: Decimal answers, advanced
  - Completing the Square and the Quadratic Formula (3 topics)
    - Solving a quadratic equation by completing the square: Decimal answers
    - Applying the quadratic formula: Decimal answers
    - Solving a word problem using a quadratic equation with irrational roots
  - Quadratic Inequalities and Nonlinear Systems (2 topics)
    - Graphically solving a system of linear and quadratic equations
    - Solving a system of linear and quadratic equations
  - Function Operations and Inverse Functions (4 topics)
    - Introduction to the composition of two functions
    - Composition of two functions: Basic
    - Inverse functions: Linear, discrete
    - Finding, evaluating, and interpreting an inverse function for a given linear relationship
- Radicals (8 topics)
  - Operations with Radical Expressions (4 topics)
    - Square root addition or subtraction
    - Square root multiplication: Basic
    - Square root multiplication: Advanced
    - Introduction to simplifying a product involving square roots using the distributive property
  - Division and Rationalization (4 topics)
    - Simplifying a quotient of square roots
    - Simplifying a quotient involving a sum or difference with a square root

- Rationalizing a denominator: Quotient involving square roots
  - Rationalizing a denominator: Square root of a fraction
- Data Analysis and Probability (20 topics)
  - Collecting Data (2 topics)
    - Classification of variables
    - Classifying samples
  - Frequency Tables (5 topics)
    - Constructing a two-way frequency table: Basic
    - Constructing a two-way frequency table: Advanced
    - Computing a percentage from a table of values
    - Making an inference using a two-way frequency table
    - Calculating relative frequencies in a contingency table
  - Graphs of Data (2 topics)
    - Representing data on a dot plot
    - Constructing a frequency distribution and a histogram
  - Measures of Center and Spread (5 topics)
    - Range of a data set
    - Mean of a data set
    - Mean and median of a data set
    - How changing a value affects the mean and median
    - Choosing the best measure to describe data
  - Comparing Data (6 topics)
    - Using back-to-back stem-and-leaf plots to compare data sets
    - Five-number summary and interquartile range
    - Interpreting a box-and-whisker plot: Problem type 1
    - Interpreting a box-and-whisker plot: Problem type 2
    - Constructing a box-and-whisker plot
    - Using box-and-whisker plots to compare data sets
- Other Topics Available(\*) (756 additional topics)
  - Whole Numbers (16 topics)
    - Estimating a sum of whole numbers: Problem type 1
    - Estimating a sum of whole numbers: Problem type 2
    - Estimating a difference of whole numbers: Problem type 1
    - Estimating a difference of whole numbers: Problem type 2
    - Estimating a product
    - Writing expressions using exponents
    - Power of 10: Positive exponent
    - Order of operations with whole numbers and grouping symbols
    - Factors
    - Prime numbers
    - Prime factorization
    - Prime factorization: Exponent notation
    - Greatest common factor of 3 numbers
    - Least common multiple of 2 numbers
    - Least common multiple of 3 numbers
    - Word problem involving the least common multiple of 2 numbers
  - Fractions (37 topics)
    - Understanding equivalent fractions with shapes containing up to 8 equal parts
    - Identifying a fraction on a number line
    - Plotting fractions on a number line
    - Position of mixed numbers on a number line
    - Plotting mixed numbers on a number line
    - Finding the LCD of two fractions
    - Addition or subtraction of fractions with the same denominator
    - Word problem involving addition or subtraction of fractions with the same denominator
    - Word problem involving addition or subtraction of fractions with different denominators
    - Writing an improper fraction as a mixed number
    - Writing a mixed number as an improper fraction
    - Addition or subtraction of mixed numbers with the same denominator
    - Addition of mixed numbers with the same denominator and renaming: Problem type 1
    - Addition of mixed numbers with the same denominator and renaming: Problem type 2
    - Subtraction of mixed numbers with the same denominator and renaming: Problem type 1
    - Subtraction of mixed numbers with the same denominator and renaming: Problem type 2
    - Addition or subtraction of mixed numbers with different denominators without renaming
    - Addition of mixed numbers with different denominators and renaming

- Subtraction of mixed numbers with different denominators and renaming
  - Word problem involving addition or subtraction of mixed numbers with different denominators
  - Word problem involving multiplying a fraction and a whole number
  - Multiplication of 3 fractions
  - Word problem involving fractions and multiplication
  - Multi-step word problem involving fractions and multiplication
  - Determining if a quantity is increased or decreased when multiplied by a fraction
  - The reciprocal of a number
  - Division involving a whole number and a fraction
  - Fraction division
  - Complex fraction without variables: Problem type 1
  - Word problem involving fractions and division
  - Multiplying mixed numbers: Problem type 1
  - Multiplying mixed numbers: Problem type 2
  - Multiplying a mixed number and a whole number: Problem type 1
  - Multiplying a mixed number and a whole number: Problem type 2
  - Division with a mixed number and a whole number
  - Mixed number division
  - Word problem involving multiplication or division with mixed numbers
- Decimals and Percents (65 topics)
    - Writing a decimal and a fraction for a shaded region
    - Reading decimal position on a number line: Tenths
    - Reading decimal position on a number line: Hundredths
    - Introduction to ordering decimals
    - Ordering decimals
    - Converting a decimal to a proper fraction without simplifying: Advanced
    - Converting a decimal to a proper fraction in simplest form: Basic
    - Converting a decimal to a proper fraction in simplest form: Advanced
    - Converting a decimal to a mixed number and an improper fraction in simplest form: Basic
    - Converting a decimal to a mixed number and an improper fraction in simplest form: Advanced
    - Decimal addition with 3 numbers
    - Subtraction of aligned decimals
    - Decimal subtraction: Advanced
    - Decimal addition and subtraction with 3 or more numbers
    - Word problem with addition of 3 or 4 decimals and whole numbers
    - Multiplication of a decimal by a power of 0.1
    - Multiplying decimals less than 1: Problem type 2
    - Word problem with multiplication of two decimals
    - Division of a decimal by a 1-digit decimal: Problem type 1
    - Division of a decimal by a 2-digit decimal
    - Word problem with multiple decimal operations: Problem type 2
    - Word problem with division of two decimals
    - Converting a fraction to a terminating decimal: Advanced
    - Converting a fraction to a repeating decimal: Basic
    - Converting a fraction to a repeating decimal: Advanced
    - Using a calculator to convert a fraction to a rounded decimal
    - Ordering fractions and decimals
    - Writing ratios using different notations
    - Writing ratios for real-world situations
    - Simplifying a ratio of whole numbers: Problem type 1
    - Simplifying a ratio of decimals
    - Using a tape diagram to solve a problem involving ratios
    - Using tables to compare ratios
    - Finding a unit price
    - Computing unit prices to find the better buy
    - Word problem on unit rates associated with ratios of whole numbers: Decimal answers
    - Using a tape diagram to solve a problem on unit rates: Problem type 1
    - Finding a rate given a pictorial representation of a real-world situation
    - Finding the percentage of a grid that is shaded
    - Representing benchmark percentages on a grid
    - Converting a mixed number percentage to a decimal
    - Converting between percentages and decimals in a real-world situation
    - Converting a percentage to a fraction in simplest form
    - Finding benchmark fractions and percentages for a figure
    - Comparing fractions, decimals, and percentages using a number line
    - Using a calculator to convert a fraction to a rounded percentage
    - Using a double number line to find the part or the whole in a percentage problem
    - Finding a percentage of a total amount: Real-world situations
    - Finding a percentage of a total amount without a calculator: Sales tax, commission, discount
    - Estimating a tip without a calculator
    - Using a double number line to find a percentage
    - Writing a ratio as a percentage
    - Writing a ratio as a percentage without a calculator

- Finding the rate of a tax or commission
- Choosing U.S. Customary measurement units
- Using a double number line to convert U.S. Customary units with whole numbers
- Using a double number line to convert U.S. Customary units with decimals
- Writing and solving a proportion to convert U.S. Customary units of length
- U.S. Customary length conversions involving rounding decimals
- Word problem involving a U.S. Customary length conversion
- Choosing metric measurement units
- Metric distance conversion with whole number values
- Writing and solving a proportion to convert metric units of length
- Metric distance conversion with decimal values
- Conversions with currency
- Real Numbers (87 topics)
  - Plotting opposite integers on a number line
  - Plotting rational numbers on a number line
  - Comparing integers using a number line
  - Using a number line to compare signed numbers in context
  - Interpreting a table of signed numbers that relate to a real-world situation: Problem type 1
  - Interpreting a table of signed numbers that relate to a real-world situation: Problem type 2
  - Comparing signed numbers relating to a real-world situation
  - Approximating the location of irrational numbers on a number line
  - Approximating the location of irrational numbers on a number line to compare them
  - Ordering real numbers
  - Interpreting absolute values in context as distances from zero
  - Finding all numbers with a given absolute value
  - Identifying relative change when combining two quantities
  - Addition and subtraction with 4 or 5 integers
  - Word problem with addition or subtraction of integers
  - Operations with absolute value: Problem type 2
  - Finding the distance between two rational numbers on a number line in context
  - Word problem with multiplication or division of integers
  - Signed fraction subtraction involving double negation
  - Signed fraction addition or subtraction: Advanced
  - Addition and subtraction of 3 fractions involving signs
  - Signed fraction multiplication: Advanced
  - Signed fraction division
  - Signed decimal addition and subtraction with 3 numbers
  - Signed decimal multiplication
  - Signed decimal division
  - Exponents and integers: Problem type 2
  - Order of operations with whole numbers and exponents: Advanced
  - Order of operations with integers and exponents
  - Order of operations with fractions: Problem type 1
  - Order of operations with fractions: Problem type 2
  - Order of operations with fractions: Problem type 3
  - Squaring decimal bases: Products greater than 0.1
  - Exponents and decimals: Products less than 0.1
  - Order of operations with decimals: Problem type 1
  - Order of operations with decimals: Problem type 2
  - Order of operations with decimals: Problem type 3
  - Evaluating an algebraic expression: Whole number addition or subtraction
  - Evaluating an algebraic expression: Whole number multiplication or division
  - Evaluating an algebraic expression: Whole number operations and exponents
  - Converting between temperatures in Fahrenheit and Celsius
  - Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
  - Evaluating a linear expression: Signed decimal addition and subtraction
  - Evaluating a linear expression: Signed decimal multiplication with addition or subtraction
  - Additive property of equality with fractions and mixed numbers
  - Multiplicative property of equality with whole numbers: Fractional answers
  - Identifying numbers as integers or non-integers
  - Identifying rational decimal numbers
  - Identifying true statements about rational and irrational numbers
  - Determining the kind of decimal expansion for real numbers
  - Identifying the digits that repeat in the decimal expansion of a rational number: Problem type 1
  - Identifying the digits that repeat in the decimal expansion of a rational number: Problem type 2
  - Identifying numbers as rational or irrational
  - Interpreting a Venn diagram of 2 sets
  - Interpreting a Venn diagram of 3 sets
  - Constructing a Venn diagram to classify rational numbers
  - Constructing a Venn diagram to describe relationships between sets of rational numbers
  - Constructing a Venn diagram to classify real numbers
  - Constructing a Venn diagram to describe relationships between sets of real numbers
  - Constructing a Venn diagram with 2 sets

- Interpreting Venn diagram cardinalities with 2 sets for a real-world situation
  - Constructing a Venn diagram with 2 sets to solve a word problem
  - Constructing a Venn diagram with 3 sets
  - Interpreting Venn diagram cardinalities with 3 sets for a real-world situation
  - Constructing a Venn diagram with 3 sets to solve a word problem
  - Identifying like terms
  - Introduction to properties of addition
  - Properties of addition
  - Introduction to adding fractions with variables and common denominators
  - Combining like terms: Fractional coefficients
  - Understanding the distributive property
  - Distributive property: Fractional coefficients
  - Introduction to properties of multiplication
  - Properties of real numbers
  - Using algebra tiles to determine if two expressions are equivalent
  - Identifying properties used to simplify an algebraic expression
  - Using distribution with double negation and combining like terms to simplify: Multivariate
  - Finding the perimeter of a polygon
  - Finding the missing side length of a rectilinear figure
  - Perimeter of a piecewise rectangular figure
  - Finding the area of a rectilinear figure made from 2 rectangles
  - Finding the area of a rectilinear figure made from 2 or 3 rectangles
  - Area between two rectangles
  - Distinguishing between the area and perimeter of a rectangle
  - Solving a two-step word problem involving the area of a rectangle
  - Area of a triangle
  - Volume of a rectangular prism made of unit cubes
- Linear Equations (85 topics)
    - Solving an equation to find the value of an expression
    - Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
    - Clearing fractions in an equation
    - Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
    - Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
    - Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
    - Solving a fraction word problem using a linear equation of the form  $Ax = B$
    - Choosing stories that can be represented by given one-step equations
    - Comparing arithmetic and algebraic solutions to a word problem
    - Choosing stories that can be represented by given two-step equations
    - Writing an equation of the form  $A(x + B) = C$  to solve a word problem
    - Writing and solving a real-world problem given an equation with the variable on both sides
    - Writing a multi-step equation for a real-world situation
    - Solving a decimal word problem using a linear equation with the variable on both sides
    - Solving a fraction word problem using a linear equation with the variable on both sides
    - Solving a word problem with three unknowns using a linear equation
    - Solving a word problem involving consecutive integers
    - Solving a value mixture problem using a linear equation
    - Solving a word problem involving rates and time conversion
    - Solving a distance, rate, time problem using a linear equation
    - Converting a repeating decimal to a fraction
    - Finding a side length given the perimeter and side lengths with variables
    - Finding side lengths of squares given an area and a perimeter
    - Finding the perimeter or area of a rectangle given one of these values
    - Solving for a variable in terms of other variables using addition or subtraction: Advanced
    - Solving for a variable in terms of other variables using multiplication or division: Advanced
    - Converting between metric and U.S. Customary unit systems using dimensional analysis: U.S. Customary to metric
    - Converting between metric and U.S. Customary unit systems using dimensional analysis: Metric to U.S. Customary
    - Word problem involving U.S. Customary length conversions using dimensional analysis
    - Word problem involving a conversion between U.S. Customary units of weight and metric units of mass
    - Converting between compound units: Advanced
    - Word problem involving conversion between compound units using dimensional analysis
    - Solving a proportion of the form  $(x+a)/b = c/d$
    - Solving a proportion of the form  $a/(x+b) = c/x$
    - Introduction to solving a rational equation
    - Solving a rational equation that simplifies to linear: Denominator  $x$
    - Word problem on proportions: Problem type 2
    - Identifying congruent shapes on a grid
    - Identifying similar or congruent shapes on a grid
    - Finding a missing side length given two similar triangles
    - Relationships about ratios within and between similar triangles
    - Similar polygons
    - Similar right triangles
    - Indirect measurement
    - Finding lengths using scale models

- Using a scale drawing to find actual area
  - Finding the sale price without a calculator given the original price and percent discount
  - Finding the total cost including tax or markup
  - Combined effect of more than one markup or discount
  - Finding the original price given the sale price and percent discount
  - Finding the percentage increase or decrease: Basic
  - Solving a percent mixture problem using a linear equation
  - Finding simple interest without a calculator
  - Finding the interest and future value of a simple interest loan or investment
  - Finding the principal, rate, or time of a simple interest loan or investment
  - Computing the interest and repayment amount for a simple interest loan whose term is given in months or days
  - Finding the principal, rate, or time for a simple interest loan whose term is given in months or days
  - Introduction to solving an absolute value equation
  - Solving an absolute value equation: Problem type 1
  - Solving an absolute value equation: Problem type 2
  - Solving an absolute value equation: Problem type 3
  - Solving an absolute value equation: Problem type 4
  - Writing an absolute value equation to solve a word problem and describing the solution
  - Calculating income tax
  - Comparing discounts
  - Examining a savings plan for college
  - Calculations involving paying for college
  - Comparing total costs for attending different colleges
  - Computations involving cost of living and hourly wage
    - Using a family budget estimator to determine the minimum monthly budget and average hourly wage needed for a family
  - Hourly gross pay with overtime
  - Gross pay with commission and salary
  - Gross pay with variable commission scale
  - Calculations involving purchases with debit and credit cards
  - Comparing costs of checking accounts
  - Reading a credit report
  - Understanding the impact of a credit score
  - Determining the value of credit reports to borrowers and lenders
    - Deciding when it is applicable to pay with cash or credit and examining the advantages and disadvantages of different payment methods
  - Word problem on financial responsibility
  - Calculating and comparing monthly payments using the ALEKS loan calculator
  - Calculating monthly payment, total payment, and interest using the ALEKS loan calculator
  - Calculating and comparing total loan payments using the ALEKS loan calculator
  - Calculating and comparing simple interest and compound interest
  - Using the ALEKS periodic deposit calculator to compute savings which include periodic deposits
- Linear Inequalities (15 topics)
    - Additive property of inequality with signed fractions
    - Additive property of inequality with signed decimals
    - Solving a linear inequality with multiple occurrences of the variable: Problem type 3
    - Solving a word problem involving area using a one-step linear inequality: Area and lengths
    - Translating a sentence into a multi-step inequality
    - Solving a word problem using a two-step linear inequality and describing the solution
    - Solving a decimal word problem using a linear inequality with the variable on both sides
    - Writing a compound inequality given a graph on the number line
    - Solving a compound linear inequality: Graph solution, advanced
    - Solving an absolute value inequality: Problem type 1
    - Writing an absolute value inequality given a graph on the number line
    - Solving an absolute value inequality: Problem type 2
    - Solving an absolute value inequality: Problem type 3
    - Solving an absolute value inequality: Problem type 4
    - Solving an absolute value inequality: Problem type 5
  - Functions and Lines (64 topics)
    - Finding distances between points that share a common coordinate given their coordinates
    - Plotting points that share a coordinate and using absolute value to find the distance between them
    - Midpoint of a line segment in the plane
    - Finding an endpoint of a line segment given the other endpoint and the midpoint
    - Deriving the midpoint formula on the coordinate plane using previous knowledge about midpoint on a number line
    - Writing a function rule given a table of ordered pairs: Two-step rules
    - Comparing two rules with forms of  $y=ax$  and  $y=x+a$
    - Finding x- and y-intercepts of a line given the equation: Advanced
    - Graphing a line given its x- and y-intercepts
    - Making a table and plotting points given a unit rate
    - Identifying proportional relationships in equations
    - Identifying proportional relationships in tables by calculating unit rates: Whole numbers
    - Identifying proportional relationships in tables by calculating unit rates: Fractions

- Determining whether a relationship is proportional given a real-world situation
  - Identifying proportional relationships in graphs: Basic
  - Identifying proportional relationships in graphs: Advanced
  - Graphing a relationship given a real-world situation to determine if the relationship is proportional
  - Writing an equation and describing a proportional relationship given a graph or table
  - Finding outputs and rate of increase given the graph of a line that models a real-world situation
  - Comparing proportional relationships given in different forms
  - Finding the coordinate that yields a given slope
  - Deriving the slope formula
  - Using right triangles to find the slope of a line
  - Identifying linear equations: Basic
  - Identifying linear equations: Advanced
  - Writing an equation and graphing a line given its slope and y-intercept
  - Graphing a line given its equation in point-slope form
  - Writing the equations of vertical and horizontal lines through a given point
  - Deriving the equation of a line through the origin
  - Deriving the equation of a line not going through the origin
  - Identifying parallel and perpendicular lines from equations
  - Identifying parallel and perpendicular lines from coordinates
  - Finding inputs and outputs of a two-step function that models a real-world situation: Two variable equation
  - Writing and evaluating a function that models a real-world situation: Advanced
  - Graphing ordered pairs and writing an equation from a table of values in context
  - Writing an equation and drawing its graph to model a real-world situation: Basic
  - Graphing a linear function that models a simple interest situation and identifying key features
  - Identifying independent and dependent quantities from tables and graphs
  - Identifying independent and dependent variables from equations or real-world situations
  - Classifying linear and nonlinear relationships from scatter plots
    - Using technology to calculate the correlation coefficients for two sets of bivariate data to compare the linear relationships
  - Identifying outliers and clustering in scatter plots
  - Identifying functions given a verbal description
  - Variable expressions as inputs of functions: Problem type 1
  - Finding outputs of a one-step function that models a real-world situation: Function notation
  - Finding inputs and outputs of a function from its graph
  - Finding intercepts of a nonlinear function given its graph
  - Finding local maxima and minima of a function given the graph
  - Graphing an integer function and finding its range for a given domain
  - Graphing a function of the form  $f(x) = ax + b$ : Integer slope
  - Graphing a function of the form  $f(x) = ax + b$ : Fractional slope
  - Graphing an absolute value equation in the plane: Advanced
  - Graphing a parabola of the form  $y = ax^2 + c$
  - Graphing a function of the form  $f(x) = ax^2$
  - Graphing a function of the form  $f(x) = ax^2 + c$
  - Graphing a cubic function of the form  $y = ax^3$
  - Classifying function types given graphs of functions: Linear, exponential, and quadratic
  - Classifying function types given graphs of functions: Absolute value, cubic, square root, and cubic root
  - Classifying function types given equations of functions: Problem type 1
  - Classifying function types given equations of functions: Problem type 2
  - Translating the graph of a function: One step
  - Translating the graph of a function: Two steps
  - Transforming the graph of a function by reflecting over an axis
  - Writing an equation for a function after a vertical and horizontal translation
- Systems of Linear Equations and Inequalities (13 topics)
    - Using a graphing calculator to solve a system of linear equations: Advanced
    - Solving a system of linear equations with fractional coefficients
    - Solving a system of linear equations with decimal coefficients
    - Solving a word problem involving a system of linear equations by graphing and estimating a solution
    - Solving a word problem using a system of linear equations of the form  $Ax + By = C$
    - Writing and solving a system of two linear equations given a verbal description
    - Solving a percent mixture problem using a system of linear equations
    - Solving a tax rate or interest rate problem using a system of linear equations
    - Solving a word problem using a  $3 \times 3$  system of linear equations: Problem type 1
    - Scalar multiplication of a matrix
    - Addition or subtraction of matrices
    - Graphing a system of three linear inequalities
    - Solving a word problem using a system of linear inequalities: Problem type 1
  - Exponents and Exponential Functions (51 topics)
    - Understanding the product rule of exponents
    - Ordering numbers with positive exponents
    - Understanding the power rules of exponents
    - Power and product rules with positive exponents

- Introduction to the quotient rule with positive exponents: Whole number base
- Introduction to the LCM of two monomials
- Least common multiple of two monomials
- Power of 10: Negative exponent
- Ordering numbers with negative exponents
- Introduction to the product rule with negative exponents: Whole number base
- Product rule with negative exponents
- Introduction to the quotient rule with negative exponents: Whole number base
- Introduction to the power of a power rule with negative exponents: Whole number base
- Power and quotient rules with negative exponents: Problem type 2
- Power, product, and quotient rules with negative exponents
- Finding all square roots of a number
- Estimating a square root
- Using numerical methods to approximate a square root to the nearest tenth
- Using numerical methods to approximate a square root to the nearest hundredth
- Order of operations with exponents and radicals
- Finding  $n^{\text{th}}$  roots of perfect  $n^{\text{th}}$  powers with signs
- Rational exponents: Unit fraction exponents and bases involving signs
- Rational exponents: Negative exponents and fractional bases
- Rational exponents: Products and quotients with negative exponents
- Rational exponents: Powers of powers with negative exponents
- Introduction to scientific notation with positive exponents
- Scientific notation with a positive exponent
- Introduction to scientific notation with negative exponents
- Scientific notation with a negative exponent
- Converting between scientific notation and standard form in a real-world situation
- Estimating numbers using scientific notation
- Choosing metric units and converting to the base unit in scientific notation
- Expressing calculator notation as scientific notation
- Multiplying numbers written in scientific notation: Basic
- Multiplying numbers written in scientific notation: Advanced
- Multiplying numbers written in decimal form or scientific notation in a real-world situation
- Dividing numbers written in scientific notation: Basic
- Dividing numbers written in scientific notation: Advanced
- Finding powers of numbers written in scientific notation
- Finding the scale factor between numbers given in scientific notation in a real-world situation
- Adding or subtracting numbers written in scientific notation: Same exponents, basic
- Adding or subtracting numbers written in scientific notation: Same exponents, advanced
- Adding or subtracting numbers written in scientific notation: Different exponents
- Estimating the sum or difference of two numbers written in scientific notation
- Graphing an exponential function and its asymptote:  $f(x) = b^x$
- Graphing an exponential function and its asymptote:  $f(x) = a(b)^x$
- Graphing an exponential function and its asymptote:  $f(x) = b^{-x}$  or  $f(x) = -b^x$  or  $f(x) = -b^{-x}$
- Finding the future value and interest for an investment earning compound interest
- Finding the present value of an investment earning compound interest
- Solving an exponential equation by finding common bases: Linear exponents
- Identifying arithmetic and geometric sequences
- Polynomials and Factoring (35 topics)
  - Degree of a multivariate polynomial
  - Simplifying a sum or difference of three univariate polynomials
  - Simplifying a sum or difference of multivariate polynomials
  - Multiplying a univariate polynomial by a monomial with a negative coefficient
  - Multiplying a multivariate polynomial by a monomial
  - Multiplying conjugate binomials: Multivariate
  - Squaring a binomial: Multivariate
  - Multiplication involving binomials and trinomials in two variables
  - Greatest common factor of three univariate monomials
  - Greatest common factor of two multivariate monomials
  - Factoring out a monomial from a polynomial: Multivariate
  - Factoring out a binomial from a polynomial: GCF factoring, basic
  - Factoring a multivariate polynomial by grouping: Problem type 1
  - Factoring a quadratic in two variables with leading coefficient 1
  - Factoring a quadratic with leading coefficient greater than 1: Problem type 3
  - Factoring a quadratic in two variables with leading coefficient greater than 1
  - Factoring a perfect square trinomial in two variables
  - Factoring a difference of squares in two variables
  - Factoring a polynomial involving a GCF and a difference of squares: Multivariate
  - Factoring a product of a quadratic trinomial and a monomial
  - Factoring with repeated use of the difference of squares formula
  - Factoring a sum or difference of two cubes
  - Dividing a polynomial by a monomial: Univariate
  - Dividing a polynomial by a monomial: Multivariate

- Simplifying a ratio of factored polynomials: Linear factors
  - Simplifying a ratio of polynomials using GCF factoring
  - Polynomial long division: Problem type 1
  - Polynomial long division: Problem type 2
  - Simplifying a ratio of factored polynomials: Factors with exponents
  - Simplifying a ratio of linear polynomials: 1, -1, and no simplification
  - Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
  - Simplifying a ratio of polynomials: Problem type 1
  - Simplifying a ratio of polynomials: Problem type 2
  - Simplifying a ratio of polynomials: Problem type 3
  - Simplifying a ratio of multivariate polynomials
- Quadratic Functions and Equations (18 topics)
    - Solving a quadratic equation needing simplification
    - Writing a quadratic equation given the roots and the leading coefficient
    - Graphing a parabola of the form  $y = ax^2 + bx + c$ : Rational coefficients
    - Finding the linear factors of a quadratic function given its zeros and describing the general relationship between linear factors and zeros
    - Finding the zeros of a quadratic function given its linear factors and describing the general relationship between linear factors and zeros
    - Using a graphing calculator to find the zeros of a quadratic function
    - Range of a quadratic function
    - Determining whether a given situation is best modeled by a linear, exponential, or quadratic function
    - Solving a quadratic equation by completing the square: Exact answers
    - Applying the quadratic formula: Exact answers
    - Deriving the quadratic formula
    - Discriminant of a quadratic equation
    - Solving a quadratic inequality written in factored form
    - Solving a quadratic inequality
    - Graphing a quadratic inequality: Problem type 1
    - Graphing a quadratic inequality: Problem type 2
    - Using a graphing calculator to solve a nonlinear system of equations: Basic
    - Sum, difference, and product of two functions
- Radicals (50 topics)
    - Square roots of integers raised to even exponents
    - Introduction to simplifying a radical expression with an even exponent
    - Square root of a perfect square monomial
    - Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power fraction
    - Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power monomial
    - Table for a square root function
    - Graphing a square root function: Problem type 1
    - Graphing a square root function: Problem type 2
    - Graphing a square root function: Problem type 3
    - Simplifying a radical expression with an even exponent
    - Introduction to simplifying a radical expression with an odd exponent
    - Simplifying a radical expression with an odd exponent
    - Simplifying a radical expression with two variables
    - Simplifying a higher root of a whole number
    - Introduction to simplifying a higher radical expression
    - Simplifying a higher radical expression: Univariate
    - Simplifying a higher radical expression: Multivariate
    - Square root addition or subtraction with three terms
    - Introduction to simplifying a sum or difference of radical expressions: Univariate
    - Simplifying a sum or difference of radical expressions: Univariate
    - Introduction to simplifying a product of radical expressions: Univariate
    - Simplifying a product of radical expressions: Univariate
    - Simplifying a product of radical expressions: Multivariate
    - Introduction to simplifying a product of higher roots
    - Simplifying a product of higher radical expressions
    - Simplifying a product involving square roots using the distributive property: Basic
    - Simplifying a product involving square roots using the distributive property: Advanced
    - Rationalizing a denominator: Quotient involving a monomial
    - Rationalizing a denominator using conjugates: Integer numerator
    - Introduction to solving a radical equation
    - Solving a radical equation that simplifies to a linear equation: One radical, basic
    - Word problem involving radical equations: Basic
    - Word problem involving radical equations: Advanced
    - Solving an equation of the form  $x^3 = a$  using integers
    - Introduction to the Pythagorean Theorem
    - Pythagorean Theorem
    - Using the Pythagorean Theorem to find distance on a grid
    - Word problem involving the Pythagorean Theorem

- Word problem involving the Pythagorean Theorem in three dimensions
- Using the Pythagorean Theorem repeatedly
- Identifying side lengths that give right triangles
- Demonstrating the converse of the Pythagorean Theorem
- Informal proof of the converse of the Pythagorean Theorem
- Informal proof of the Pythagorean Theorem
- Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
- Using the Pythagorean Theorem to find the distance between two points in the plane in context
- Distance between two points in the plane: Exact answers
- Distance between two points in the plane: Decimal answers
- Deriving the distance formula using the Pythagorean Theorem
- Finding the perimeter of a triangle, trapezoid, or parallelogram in the coordinate plane
- Geometry (139 topics)
  - Introduction to angle addition
  - Writing and solving an equation involving adjacent angles
  - Finding an angle measure in a figure with a right or straight angle
  - Finding supplementary and complementary angles
  - Solving an equation involving complementary or supplementary angles
  - Writing and solving an equation involving complementary or supplementary angles
  - Identifying supplementary and vertical angles
  - Finding angle measures given two intersecting lines
  - Solving equations involving vertical angles
  - Writing and solving an equation involving vertical angles
  - Measuring an angle with the protractor
  - Drawing an angle with the protractor
  - Identifying corresponding and alternate angles
  - Finding angle measures given two parallel lines cut by a transversal
  - Solving equations involving angles and a pair of parallel lines
  - Establishing facts about the angles created when parallel lines are cut by a transversal
  - Finding an angle measure of a triangle given two angles
  - Finding an angle measure for a triangle with an extended side
  - Finding an angle measure given extended triangles
  - Finding an angle measure given a triangle and parallel lines
  - Finding angle measures of a triangle given angles with variables
  - Writing an equation to find angle measures of a triangle given angles with variables
  - Finding angle measures of an isosceles triangle given angles with variables
  - Finding an angle measure for a triangle sharing a side with another triangle
  - Establishing facts about the interior angles of a triangle
  - Establishing facts about the interior and exterior angles of a triangle
  - Creating triangles from given side lengths: Problem type 1
  - Creating triangles from given side lengths: Problem type 2
  - Using triangle inequality to determine if side lengths form a triangle
  - Determining if a triangle is possible based on given angle measures
  - Determining if given measurements define a unique triangle, more than one triangle, or no triangle
  - Drawing triangles with given conditions: Angle measures
  - Drawing triangles with given conditions: Side lengths and angle measures
  - Drawing a circle with a given radius or diameter
  - Drawing triangles with given side lengths using a compass
  - Finding angle measures of a triangle given two angles of a similar triangle
  - Finding angle measures and side ratios to determine if two triangles are similar
  - Drawing and identifying a polygon in the coordinate plane
  - Finding the coordinates of a point to make a parallelogram
  - Sum of the angle measures of a quadrilateral
  - Informally deriving the formula for the sum of interior angles of polygons by decomposing them into triangles
  - Finding the sum of the interior angle measures of a convex polygon given the number of sides
  - Finding the number of sides of a convex polygon given the sum of the measures of the interior angles
  - Finding a missing interior angle measure in a convex polygon
  - Translating a point and giving its coordinates: One step
  - Translating a point and giving its coordinates: Two steps
  - Properties of translated figures
  - Determining if figures are related by a translation
  - Translating a polygon
  - Using a translated point to find coordinates of other translated points
  - Writing a rule to describe a translation
  - Reflecting a point across an axis
  - Reflecting a point across both coordinate axes
  - Reflecting a point across an axis and giving its coordinates
  - Finding the coordinates of a point reflected across an axis
  - Finding the coordinates of a point reflected across both axes
  - Reflecting a polygon across the x-axis or y-axis
  - Properties of reflected figures
  - Determining if figures are related by a reflection
  - Reflecting a polygon over a vertical or horizontal line

- Finding the coordinates of three points reflected over an axis
- Finding the coordinates of a point reflected across an axis and translated
- Writing a rule to describe a reflection
- Identifying transformations
- Rotating a point and giving its coordinates
- Properties of rotated figures
- Determining if figures are related by a rotation
- Rotating a figure about the origin
- Writing a rule to describe a rotation
- Determining if figures are congruent and related by a transformation
- Determining if figures are congruent and related by a sequence of transformations
- Finding an angle of rotation
- Identifying rotational symmetry and angles of rotation
- Identifying figures that have rotational symmetry or reflectional symmetry
- Dilating a segment and giving the coordinates of its endpoints
- The effect of dilation on side length
- Determining if figures are related by a dilation
- Finding a scale factor given a dilation in the coordinate plane
- The effect of dilation on area
- Dilating a figure
- Performing a composition of dilations
- Performing a composition consisting of a rigid transformation and a dilation
- Writing a rule to describe a dilation
- Determining if figures are similar and related by a sequence of transformations
- Identifying transformations and determining if they preserve congruent figures
- Finding the area of a right triangle using the Pythagorean Theorem
- Finding the area of a trapezoid on a grid by using triangles and rectangles
- Decomposing a trapezoid or parallelogram to find its area given a situation in context
- Word problem involving the area between two rectangles
- Area involving rectangles and triangles
- Circumference of a circle
- Perimeter involving rectangles and circles
- Area of a circle
- Circumference and area of a circle
- Circumference and area of a circle: Exact answers in terms of pi
- Area involving rectangles and circles
- Area between two concentric circles
- Word problem involving the area between two concentric circles
- Area involving inscribed figures
- Area involving multiple inscribed figures
- Area of a sector of a circle: Exact answer in terms of pi
- Writing equivalent expressions for the volume of a rectangular prism
- Word problem involving the volume of a rectangular prism
- Word problem involving the rate of filling or emptying a rectangular prism
- Volume of a triangular prism
- Volume of a cylinder
- Describing the formula for the volume of a cylinder
- Word problem involving the volume of a cylinder
- Word problem involving the rate of filling or emptying a cylinder
- Volume of a pyramid
- Relating the volumes of a rectangular prism and a rectangular pyramid
- Relating the volumes of a triangular prism and a triangular pyramid
- Volume of a cone
- Volume of a cone: Exact answers in terms of pi
- Relating the volumes of a cylinder and a cone
- Word problem involving the volume of a cone
- Volume of a sphere
- Word problem involving the volume of a sphere
- Nets of solids
- Identifying horizontal and vertical cross sections of solids
- Surface area of a cube or a rectangular prism
- Using a net to find the surface area of a rectangular prism
- Using a net to find the lateral surface area and total surface area of a rectangular prism
- Deriving the formula for the surface area of a rectangular prism
- Word problem involving the surface area of a rectangular prism
- Surface area of a triangular prism
- Using a net to find the surface area of a triangular prism
- Using a net to find the lateral surface area and total surface area of a triangular prism
- Deriving the formula for the surface area of a right triangular prism
- Surface area of a cylinder
- Surface area of a cylinder: Exact answers in terms of pi
- Deriving the formula for the surface area of a cylinder
- Word problem involving the surface area of a cylinder
- Word problem involving the surface area of rectangular prisms and cylinders

- Using a net to find the lateral surface area and total surface area of a pyramid
- Word problem involving the surface area of rectangular prisms and pyramids
- Lateral surface area and surface area of a cone
- Lateral surface area and surface area of a cone: Exact answers in terms of pi
- Surface area of a sphere
- Data Analysis and Probability (81 topics)
  - Identifying statistical questions
  - Choosing an appropriate method for gathering data: Problem type 1
  - Choosing an appropriate method for gathering data: Problem type 2
  - Introduction to expectation
  - Constructing a frequency distribution for grouped data
  - Constructing a frequency distribution for non-grouped data
  - Constructing a relative frequency distribution for grouped data
  - Making a reasonable inference based on proportion statistics
  - Finding if a question can be answered by the data
  - Representing data with fractional values on a dot plot
  - Representing data on a bar graph
  - Interpreting data in a bar graph with up to six categories
  - Interpreting a histogram
  - Interpreting a stem-and-leaf plot
  - Interpreting a circle graph or pie chart
  - Finding a percentage of a total amount in a circle graph
  - Angle measure in a circle graph
  - Constructing a percent bar graph
  - Mode of a data set
  - Finding the mode and range from a dot plot (line plot)
  - How changing a value affects the range and IQR
  - Finding the mean of a symmetric distribution
  - Computations involving the mean, sample size, and sum of a data set
  - Finding the value for a new score that will yield a given mean
  - Weighted mean
  - Finding outliers in a data set
  - Identifying peaks, symmetry, gaps, and clusters in a dot plot (line plot)
  - Identifying the center, spread, and shape of a data set
  - Computing mean absolute deviation from a list of numerical values
  - Computing mean absolute deviation from a bar graph
  - Assessing the degree of overlap of two distributions
  - Comparing measures of center and variation
  - Finding sample size and comparing samples for estimating the mean
  - Interpreting a tree diagram
  - Introduction to the counting principle
  - Counting principle
  - Counting principle with repetition allowed
  - Factorial expressions
  - Counting arrangements of objects that are not all distinct
  - Computing permutations and combinations
  - Word problem involving permutations
  - Word problem involving combinations
  - Introduction to permutations and combinations
  - Permutations, combinations, and the multiplication principle for counting
  - Determining a sample space and outcomes for an event: Experiment involving a single selection
  - Introduction to the probability of an event
  - Probability involving one die or choosing from n distinct objects
  - Probability involving choosing from objects that are not distinct
  - Probabilities of an event and its complement
  - Experimental and theoretical probability
  - Finding the odds in favor and against
  - Determining a sample space and outcomes for an event: Experiment involving multiple selections
  - Outcomes and event probability
  - Experimental and theoretical probability for compound events
  - Probabilities involving two rolls of a die
  - Probabilities of a permutation and a combination
  - Identifying independent events given descriptions of experiments
  - Probability of independent events
  - Probability of dependent events
  - Probability of dependent events involving a survey
  - Determining outcomes for unions, intersections, and complements of events
  - Using a Venn diagram to understand the addition rule for probability
  - Outcomes and event probability: Addition rule
  - Probability of the union of two events
  - Word problem involving the probability of a union
  - Probability of intersection or union: Word problems
  - Computing conditional probability using a sample space

- Outcomes and event probability: Conditional probability
- Identifying independent events given values of probabilities
- Computing conditional probability using a two-way frequency table
- Computing conditional probability to make an inference using a two-way frequency table
- Identifying outcomes in a random number table used to simulate a simple event
- Using a random number table to simulate a simple event
- Generating a random number table with technology to simulate a simple event
- Identifying outcomes in a random number table used to simulate a compound event
- Using a random number table to simulate a compound event
- Generating a random number table with technology to simulate a compound event
- Generating random samples from a population with known characteristics
- Population standard deviation
- Using the empirical rule to identify values and percentages of a normal distribution
- Word problem involving calculations from a normal distribution

**\*Other Topics Available** By default, these topics are NOT included in the course, but can be added using the content editor in the Teacher Module.