Beginning Algebra

This course covers the topics outlined below and is available for use with integrated, interactive eBooks. You can customize the scope and sequence of this course to meet your curricular needs.

Curriculum (375 topics + 443 additional topics)

- Arithmetic Readiness (89 topics)
  - Whole Numbers (15 topics)
    - Writing expressions using exponents
    - Introduction to exponents
    - Power of 10: Positive exponent
    - Order of operations with whole numbers
    - Order of operations with whole numbers and grouping symbols
    - Order of operations with whole numbers and exponents: Basic
    - Order of operations with whole numbers and exponents: Advanced
    - Evaluating an algebraic expression: Whole numbers with two operations
    - Evaluating an algebraic expression: Whole number operations and exponents
    - Prime numbers
    - Prime factorization
    - Greatest common factor of 2 numbers
    - Least common multiple of 2 numbers
    - Least common multiple of 3 numbers
    - Solving a word problem on proportions using a unit rate
  - Fractions (21 topics)
    - Equivalent fractions
    - Simplifying a fraction
    - Addition or subtraction of fractions with the same denominator
    - Addition or subtraction of fractions with the same denominator and simplification
    - Finding the LCD of two fractions
    - Introduction to addition or subtraction of fractions with different denominators
    - Addition or subtraction of fractions with different denominators
    - Word problem involving addition or subtraction of fractions with different denominators
    - Product of a unit fraction and a whole number
    - Product of a fraction and a whole number: Problem type 1
    - Introduction to fraction multiplication
    - Fraction multiplication
    - Product of a fraction and a whole number: Problem type 2
    - Multiplication of 3 fractions
    - Exponents and fractions
    - Word problem involving fractions and multiplication
    - The reciprocal of a number
    - Division involving a whole number and a fraction
    - Fraction division
    - Word problem involving fractions and division
    - Order of operations with fractions: Problem type 1
- Mixed Numbers (13 topics)
♦ Writing an improper fraction as a mixed number
♦ Writing a mixed number as an improper fraction
♦ Mixed number addition with the same denominator and renaming
♦ Mixed number subtraction with the same denominator and renaming
♦ 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
♦ Mixed number multiplication
♦ Multiplication of a mixed number and a whole number
♦ Division with a mixed number and a whole number
♦ Mixed number division
♦ Word problem involving multiplication or division with mixed numbers

♦ Decimals (24 topics)
  ♦ Decimal place value: Tenths and hundredths
  ♦ Rounding decimals
  ♦ Converting a decimal to a proper fraction in simplest form: Basic
  ♦ Converting a decimal to a proper fraction in simplest form: Advanced
  ♦ Decimal addition with 3 numbers
  ♦ Decimal subtraction: Basic
  ♦ Decimal subtraction: Advanced
  ♦ Decimal addition and subtraction with 3 or more numbers
  ♦ Word problem with addition of 3 or 4 decimals and whole numbers
  ♦ Word problem with subtraction of a whole number and a decimal: Regrouping with zeros
  ♦ Multiplying a decimal by a whole number
  ♦ Decimal multiplication: Problem type 1
  ♦ Multiplication of a decimal by a power of ten
  ♦ Word problem with multiplication of two decimals
  ♦ Word problem with decimal addition and multiplication
  ♦ Division of a decimal by a whole number
  ♦ Division of a decimal by a 1-digit decimal
  ♦ Division of a decimal by a 2-digit decimal
  ♦ Division of a decimal by a power of ten
  ♦ Word problem with division of two decimals
  ♦ Word problem with decimal subtraction and division
  ♦ Converting a fraction to a terminating decimal: Basic
  ♦ Converting a fraction to a terminating decimal: Advanced
  ♦ Converting a fraction to a repeating decimal: Basic

♦ Converting Between Fractions, Decimals, and Percentages (9 topics)
  ♦ Converting a fraction with a denominator of 100 to a percentage
  ♦ Converting a percentage to a fraction with a denominator of 100
  ♦ Introduction to converting a percentage to a decimal
  ♦ Introduction to converting a decimal to a percentage
  ♦ Converting between percentages and decimals
  ♦ Converting a percentage to a fraction in simplest form
  ♦ Converting a fraction to a percentage: Denominator of 4, 5, or 10
  ♦ Converting a fraction to a percentage: Denominator of 20, 25, or 50
  ♦ Using a calculator to convert a fraction to a rounded percentage

♦ Geometry (7 topics)
  ♦ Perimeter of a polygon
  ♦ Perimeter of a square or a rectangle
  ♦ Area of a square or a rectangle
  ♦ Area of a triangle
• Real Numbers and Algebraic Expressions (48 topics)
  ♦ Plotting and Ordering (7 topics)
    ♦ Plotting integers on a number line
    ♦ Writing a signed number for a real−world situation
    ♦ Introduction to ordering decimals
    ♦ Ordering integers
    ♦ Square root of a perfect square
    ♦ Using a calculator to approximate a square root
    ♦ Absolute value of a number
  ♦ Operations with Rational Numbers (22 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
    ♦ Addition and subtraction with 4 or 5 integers
    ♦ Word problem with addition or subtraction of integers
    ♦ Integer multiplication and division
    ♦ Multiplication of 3 or 4 integers
    ♦ Division involving zero
    ♦ Identifying numbers as integers or non−integers
    ♦ Identifying numbers as rational or irrational
    ♦ Signed fraction addition or subtraction: Basic
    ♦ Signed fraction subtraction involving double negation
    ♦ Signed fraction multiplication: Basic
    ♦ Signed fraction multiplication: Advanced
    ♦ Signed fraction division
    ♦ Signed decimal addition and subtraction
    ♦ Signed decimal addition and subtraction with 3 numbers
    ♦ Signed decimal multiplication
    ♦ Signed decimal division
  ♦ Exponents and Order of Operations (5 topics)
    ♦ Exponents and integers: Problem type 1
    ♦ Exponents and integers: Problem type 2
    ♦ Exponents and signed fractions
    ♦ Order of operations with integers
    ♦ Order of operations with integers and exponents
  ♦ Evaluating Expressions (2 topics)
    ♦ Evaluating a linear expression: Integer multiplication with addition or subtraction
    ♦ Evaluating a quadratic expression: Integers
  ♦ Properties of Real Numbers (12 topics)
    ♦ Combining like terms: Whole number coefficients
    ♦ Combining like terms: Integer coefficients
    ♦ Introduction to properties of addition
    ♦ Properties of addition
    ♦ Multiplying a constant and a linear monomial
    ♦ Distributive property: Whole number coefficients
    ♦ Distributive property: Integer coefficients
    ♦ Introduction to properties of multiplication
Properties of real numbers

- Using distribution and combining like terms to simplify: Univariate
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Combining like terms in a quadratic expression

- Linear Equations (73 topics)
  - One–Step Linear Equations (9 topics)
    - 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
    - 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
  - Multi–Step Linear Equations (19 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 solving an equation with parentheses
    - Solving a multi–step equation given in fractional form
    - Solving a two–step equation with signed decimals
    - 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
    - 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 linear equation with several occurrences of the variable: Variables on both sides and two distributions
    - Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
    - Solving a two–step equation with signed fractions
    - Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
    - Solving equations with zero, one, or infinitely many solutions
    - Solving a proportion of the form x/a = b/c
    - Solving a proportion of the form (x+a)/b = c/d
  - Solving Formulas for a Variable (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 addition or subtraction: Advanced
    - Solving for a variable in terms of other variables using multiplication or division: Basic
    - Solving for a variable in terms of other variables using multiplication or division: Advanced
    - 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
  - Writing Expressions and Equations (5 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
Translating a sentence into a multi-step equation

Applications (14 topics)
- Solving a fraction word problem using a linear equation of the form $Ax = B$
- Solving a word problem with two unknowns using a linear equation
- Solving a decimal word problem using a linear equation of the form $Ax + B = C$
- Solving a decimal word problem using a linear equation with the variable on both sides
- Solving a word problem involving consecutive integers
- Solving a value mixture problem using a linear equation
- Solving a one-step word problem using the formula $d = rt$
- Solving a distance, rate, time problem using a linear equation
- Converting between temperatures in Fahrenheit and Celsius
- Finding the side length of a rectangle given its perimeter or area
- Finding a side length given the perimeter and side lengths with variables
- Finding the perimeter or area of a rectangle given one of these values
- Finding an angle measure of a triangle given two angles
- Finding angle measures of a triangle given three angles with variables

Applications Involving Percentages (19 topics)
- Finding a percentage of a whole number
- Finding a percentage of a whole number without a calculator: Basic
- Finding a percentage of a whole number without a calculator: Advanced
- Applying the percent equation: Problem type 1
- Applying the percent equation: Problem type 2
- Finding a percentage of a total amount: Real-world situations
- Finding a percentage of a total amount without a calculator: Sales tax, commission, discount
- Writing a ratio as a percentage without a calculator
- Finding the rate of a tax or commission
- Finding the total amount given the percentage of a partial amount
- 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 sale price without a calculator given the original price and percent discount
- Finding the total cost including tax or markup
- Finding the original price given the sale price and percent discount
- Finding the percentage increase or decrease: Basic
- Finding the percentage increase or decrease: Advanced
- Finding a percentage of a total amount in a circle graph
- Finding simple interest without a calculator

Linear Inequalities (18 topics)
- Writing and Graphing Inequalities (5 topics)
  - Translating a sentence by using an inequality symbol
  - Translating a sentence into a one-step 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
- Linear Inequalities and Applications (13 topics)
  - Additive property of inequality with whole numbers
  - Additive property of inequality with integers
  - Additive property of inequality with signed fractions
  - Additive property of inequality with signed decimals
  - Multiplicative property of inequality with integers
  - Multiplicative property of inequality with signed fractions
  - 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
• Lines and Functions (46 topics)
  ◆ Ordered Pairs (5 topics)
    ◇ Reading a point in the coordinate plane
    ◇ Plotting a point in the coordinate plane
    ◇ Table for a linear equation
    ◇ Identifying solutions to a linear equation in two variables
    ◇ Finding a solution to a linear equation in two variables
  ◆ Graphing and Intercepts (9 topics)
    ◇ 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 given its \( x- \) and \( y- \)intercepts
    ◇ Graphing a line by first finding its \( x- \) and \( y- \)intercepts
  ◆ Slope (6 topics)
    ◇ Classifying slopes given graphs of lines
    ◇ Finding slope given the graph of a line on a grid
    ◇ Finding slope given two points on the line
    ◇ Finding the slope 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
  ◆ Equations of Lines (14 topics)
    ◇ 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
    ◇ Writing an equation in slope–intercept form given the slope and a point
    ◇ Writing an equation in point–slope form given the slope and a point
    ◇ Writing an equation of a line given the \( y- \)intercept and another point
    ◇ Writing the equation of the line through two given points
    ◇ Writing the equations of vertical and horizontal lines through a given point
    ◇ 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 \( Ax + By = C \)
    ◇ Identifying parallel and perpendicular lines from equations
    ◇ Writing equations of lines parallel and perpendicular to a given line through a point
  ◆ Applications (5 topics)
    ◇ Writing and evaluating a function that models a real–world situation: Advanced
    ◇ Writing an equation and drawing its graph to model a real–world situation: Advanced
    ◇ 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
  ◆ Identifying Functions, Domain, and Range (3 topics)
    ◇ Identifying functions from relations
    ◇ Vertical line test
    ◇ Domain and range from ordered pairs
- Function Evaluation and Applications (4 topics)
  ◊ Table for a linear function
  ◊ Evaluating functions: Linear and quadratic or cubic
  ◊ Finding outputs of a one-step function that models a real-world situation: Function notation
  ◊ Finding outputs of a two-step function with decimals that models a real-world situation: Function notation
- Systems (12 topics)
  ◦ Systems of Linear Equations (7 topics)
    ◊ Identifying solutions to a system of linear equations
    ◊ Classifying systems of linear equations from graphs
    ◊ Graphically solving a system of linear equations
    ◊ 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 a 2x2 system of linear equations that is inconsistent or consistent dependent
  ◦ Applications (5 topics)
    ◊ Interpreting the graphs of two functions
    ◊ Solving a word problem involving a sum and another basic relationship using a system of linear equations
    ◊ Solving a word problem using a system of linear equations of the form Ax + By = C
    ◊ Solving a value mixture problem using a system of linear equations
    ◊ Solving a distance, rate, time problem using a system of linear equations
- Exponents (37 topics)
  ◦ Product, Power, and Quotient Rules (16 topics)
    ◊ Understanding the product rule of exponents
    ◊ Introduction to the product rule of exponents
    ◊ Product rule with positive exponents: Univariate
    ◊ Product rule with positive exponents: Multivariate
    ◊ Understanding the power rules of exponents
    ◊ 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
    ◊ Power and product rules with positive exponents
    ◊ 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 (14 topics)
    ◊ Evaluating expressions with exponents of zero
    ◊ Power of 10: Negative exponent
    ◊ 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
    ◊ 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
◊ Power and quotient rules with negative exponents: Problem type 2

• Scientific Notation (7 topics)
  ◊ Scientific notation with positive exponent
  ◊ Scientific notation with negative exponent
  ◊ Converting between scientific notation and standard form in a real-world situation
  ◊ Multiplying numbers written in scientific notation: Basic
  ◊ Multiplying numbers written in scientific notation: Advanced
  ◊ Dividing numbers written in scientific notation: Basic
  ◊ Dividing numbers written in scientific notation: Advanced

• Polynomials and Factoring (52 topics)
  • Polynomial Addition, Subtraction, and Multiplication (15 topics)
    ◊ Degree and leading coefficient of a univariate polynomial
    ◊ Simplifying a sum or difference of two univariate polynomials
    ◊ 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 positive coefficient
    ◊ Multiplying a univariate polynomial by a monomial with a negative coefficient
    ◊ Multiplying a multivariate polynomial by a monomial
    ◊ Multiplying binomials with leading coefficients of 1
    ◊ Multiplying binomials with leading coefficients greater than 1
    ◊ Multiplying binomials in two variables
    ◊ Multiplying conjugate binomials: Univariate
    ◊ Multiplying conjugate binomials: Multivariate
    ◊ Squaring a binomial: Univariate
    ◊ Squaring a binomial: Multivariate
    ◊ Multiplication involving binomials and trinomials in one variable
  • Polynomial Division (3 topics)
    ◊ Dividing a polynomial by a monomial: Univariate
    ◊ Dividing a polynomial by a monomial: Multivariate
    ◊ Polynomial long division: Problem type 1
  • Factoring Using the GCF (6 topics)
    ◊ Factoring a linear binomial
    ◊ Introduction to the GCF of two monomials
    ◊ Greatest common factor of three univariate monomials
    ◊ Greatest common factor of two multivariate monomials
    ◊ Factoring out a monomial from a polynomial: Univariate
    ◊ Factoring out a monomial from a polynomial: Multivariate
  • Factoring by Grouping (4 topics)
    ◊ Factoring out a binomial from a polynomial: GCF factoring, basic
    ◊ Factoring a univariate polynomial by grouping: Problem type 1
    ◊ Factoring a univariate polynomial by grouping: Problem type 2
    ◊ Factoring a multivariate polynomial by grouping: Problem type 1
  • Factoring Quadratic Trinomials (6 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 leading coefficient greater than 1: Problem type 3
    ◊ Factoring a quadratic by the ac-method
  • Factoring Special Products (8 topics)
    ◊ Factoring a perfect square trinomial with leading coefficient 1
    ◊ Factoring a perfect square trinomial with leading coefficient greater than 1
Factoring a perfect square trinomial in two variables
Factoring a difference of squares in one variable: Basic
Factoring a difference of squares in one variable: Advanced
Factoring a difference of squares in two variables
Factoring a polynomial involving a GCF and a difference of squares: Univariate
Factoring a product of a quadratic trinomial and a monomial

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 quadratic equation needing simplification
- Solving a word problem using a quadratic equation with rational roots

Pythagorean Theorem (4 topics)
- Introduction to the Pythagorean Theorem
- Pythagorean Theorem
- Word problem involving the Pythagorean Theorem
- Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle

Other Topics Available(*) (443 additional topics)

Arithmetic Readiness (59 topics)
- Factors
- Word problem with common multiples
- Addition and subtraction of 3 fractions with different denominators
- Fractional part of a circle
- Multi–step word problem involving fractions and multiplication
- Order of operations with fractions: Problem type 2
- Order of operations with fractions: Problem type 3
- Addition and subtraction of 3 mixed numbers with different denominators
- 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
- Estimating a decimal sum or difference
- Estimating a product of decimals
- Squaring decimal bases: Products greater than 0.1
- Exponents and decimals: Products less than 0.1
- Converting a fraction to a repeating decimal: Advanced
- Converting a mixed number to a terminating decimal: Basic
- Converting a mixed number to a terminating decimal: Advanced
- Order of operations with decimals: Problem type 1
- Order of operations with decimals: Problem type 2
- Order of operations with decimals: Problem type 3
- Converting a mixed number percentage to a decimal
- Converting between percentages and decimals in a real–world situation
- Converting a decimal percentage to a fraction
- Converting a fraction to a percentage in a real–world situation
- Mode of a data set
- Average of two numbers
- Mean of a data set
- Mean and median of a data set
- Weighted mean
- Interpreting a bar graph
- Interpreting a line graph
Perimeter of a polygon involving mixed numbers and fractions
◊ Sides of polygons having the same perimeter
◊ Distinguishing between the area and perimeter of a rectangle
◊ Area of a rectangle involving fractions
◊ Area of a rectangle involving mixed numbers and fractions
◊ Finding the missing length in a figure
◊ Area of a piecewise rectangular figure
◊ Word problem involving the area between two rectangles
◊ Area of a parallelogram
◊ Area of a trapezoid
◊ Perimeter involving rectangles and circles
◊ Area involving rectangles and circles
◊ Word problem involving the area between two concentric circles
◊ Area involving inscribed figures
◊ Volume of a triangular prism
◊ Volume of a pyramid
◊ Volume of a cylinder
◊ Word problem involving the rate of filling or emptying a cylinder
◊ Volume of a cone
◊ Volume of a sphere
◊ Surface area of a cube or a rectangular prism
◊ Surface area of a triangular prism
◊ Surface area of a cylinder
◊ Surface area of a sphere
◊ Acute, obtuse, and right angles
◊ Finding supplementary and complementary angles
◊ Acute, obtuse, and right triangles
◊ Classifying scalene, isosceles, and equilateral triangles by side lengths or angles

♦ Real Numbers and Algebraic Expressions (17 topics)
◊ Fractional position on a number line
◊ Reading decimal position on a number line: Tenths
◊ Reading decimal position on a number line: Hundredths
◊ Plotting rational numbers on a number line
◊ Using a common denominator to order fractions
◊ Ordering decimals
◊ Ordering fractions and decimals
◊ Estimating a square root
◊ Ordering real numbers
◊ Signed fraction addition or subtraction: Advanced
◊ Addition and subtraction of 3 fractions involving signs
◊ Operations with absolute value: Problem type 2
◊ Computing distances between decimals on the number line
◊ 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
◊ Understanding the distributive property

♦ Linear Equations (25 topics)
◊ Additive property of equality with fractions and mixed numbers
◊ Solving an equation to find the value of an expression
◊ Identifying properties used to solve a linear equation
◊ Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
◊ Introduction to solving an absolute value equation
Solving an absolute value equation: Problem type 1
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
Writing a multi-step equation for a real-world situation
Solving a word problem involving rates and time conversion
Finding the radius or the diameter of a circle given its circumference
Solving equations involving vertical angles
Finding angle measures of a right or isosceles triangle given angles with variables
Finding an angle measure given extended triangles
Finding an angle measure given a triangle and parallel lines
Finding the value for a new score that will yield a given mean
Estimating a tip without a calculator
Computing a percentage from a table of values
Finding the multiplier to give a final amount after a percentage increase or decrease
Finding the original amount given the result of a percentage increase or decrease
Finding the absolute error and percent error of a measurement
Computing a percent mixture
Solving a percent mixture problem using a linear equation
Interpreting a circle graph or pie chart
Computations from a circle graph

♦ Linear Inequalities (13 topics)
Translating a sentence into a multi-step inequality
Translating a sentence into a compound inequality
Graphing a compound inequality on the number line
Writing a compound inequality given a graph on the number line
Set-builder notation
Set-builder and interval notation
Union and intersection of finite sets
Identifying solutions to a two-step linear inequality in one variable
Solving inequalities with no solution or all real numbers as solutions
Solving a compound linear inequality: Graph solution, basic
Solving a compound linear inequality: Interval notation
Solving an absolute value inequality: Problem type 1
Solving a decimal word problem using a linear inequality with the variable on both sides

♦ Lines and Functions (46 topics)
Midpoint of a line segment in the plane
Finding x- and y-intercepts of a line given the equation: Advanced
Finding the coordinate that yields a given slope
Identifying linear equations: Advanced
Identifying linear functions given ordered pairs
Writing an equation and graphing a line given its slope and y-intercept
Graphing a line given its equation in point-slope form
Writing a function rule given a table of ordered pairs: One-step rules
Writing a function rule given a table of ordered pairs: Two-step rules
Combining functions to write a new function that models a real-world situation
Comparing properties of linear functions given in different forms
Identifying independent and dependent variables from equations or real-world situations
Solving a linear equation by graphing
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
Computing residuals
Interpreting residual plots
Linear relationship and the correlation coefficient
Identifying correlation and causation
Translating the graph of an absolute value function: One step
Translating the graph of an absolute value function: Two steps
Graphing an absolute value equation of the form \( y = A|x| \)
Graphing an absolute value equation in the plane: Basic
Graphing an absolute value equation in the plane: Advanced
How the leading coefficient affects the graph of an absolute value function
Variable expressions as inputs of functions: Problem type 1
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
Finding an output of a function from its graph
Finding inputs and outputs of a function from its graph
Domain and range from the graph of a discrete relation
Domain and range from the graph of a continuous function
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 a parabola of the form \( y = ax^2 \)
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 \( f(x) = ax^2 + c \)
Finding intercepts of a nonlinear function given its graph
Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
Finding local maxima and minima of a function given the graph
Choosing a graph to fit a narrative: Basic
Choosing a graph to fit a narrative: Advanced

Systems (17 topics)
Solving a system of linear equations with fractional coefficients
Solving a system of linear equations with decimal coefficients
Identifying the operations used to create equivalent systems of equations
Solving a 3x3 system of linear equations: Problem type 1
Solving a word problem using a system of linear equations of the form \( y = mx + b \)
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 3x3 system of linear equations: Problem type 1
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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
Graphing a system of two linear inequalities: Basic
Graphing a system of two linear inequalities: Advanced
Graphing a system of three linear inequalities
Writing a multi-step inequality for a real-world situation
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Exponents (15 topics)
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Ordering numbers with negative exponents
Power, product, and quotient rules with negative exponents
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Evaluating an exponential function that models a real-world situation
Introduction to compound interest
Finding a final amount in a word problem on exponential growth or decay
Finding the final amount in a word problem on compound interest
Finding the initial amount and rate of change given an exponential function
Writing an equation that models exponential growth or decay
Solving an exponential equation by finding common bases: Linear exponents
Graphing an exponential function: $f(x) = a^x$
Graphing an exponential function: $f(x) = a(b)^x$
Writing an exponential function rule given a table of ordered pairs
Comparing linear, polynomial, and exponential functions

Polynomials and Factoring (13 topics)
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Multiplying binomials with negative coefficients
Multiplication involving binomials and trinomials in two variables
Polynomial long division: Problem type 2
Polynomial long division: Problem type 3
Closure properties of integers and polynomials
Factoring a multivariate polynomial by grouping: Problem type 2
Factoring a quadratic in two variables with leading coefficient 1
Factoring a quadratic in two variables with leading coefficient greater than 1
Factoring a quadratic with a negative leading coefficient
Factoring a polynomial involving a GCF and a difference of squares: Multivariate
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Rational Expressions (119 topics)
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Simplifying a ratio of factored polynomials: Factors with exponents
Simplifying a ratio of polynomials using GCF factoring
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
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Multiplying rational expressions made up of linear expressions
Multiplying rational expressions involving quadratics with leading coefficients of 1
Multiplying rational expressions involving quadratics with leading coefficients greater than 1
Multiplying rational expressions involving multivariate quadratics
Dividing rational expressions involving multivariate monomials
Dividing rational expressions involving linear expressions
Dividing rational expressions involving quadratics with leading coefficients of 1
Dividing rational expressions involving quadratics with leading coefficients greater than 1
Dividing rational expressions involving multivariate quadratics
Multiplication and division of 3 rational expressions
Introduction to the LCM of two monomials
Least common multiple of two monomials
Finding the LCD of rational expressions with linear denominators: Relatively prime
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Computing unit prices to find the better buy
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Metric distance conversion with whole number values
Converting between metric and U.S. Customary unit systems
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Identifying direct variation from ordered pairs and writing equations
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Identifying direct and inverse variation from ordered pairs and writing equations
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♦ Radicals (80 topics)
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Square roots of perfect squares with signs
Introduction to simplifying a radical expression with an even exponent
Square root of a perfect square monomial
Cube root of an integer
Finding n-th roots of perfect n-th powers with signs
Finding the n-th root of a perfect n-th power fraction
Finding the n-th root of a perfect n-th power monomial
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Simplifying a radical expression with an odd exponent
Graphing a square root function: Problem type 1
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Converting between radical form and exponent form
Rational exponents: Unit fraction exponents and whole number bases
Rational exponents: Unit fraction exponents and bases involving signs
Rational exponents: Non−unit fraction exponent with a whole number base
Rational exponents: Negative exponents and fractional bases
Rational exponents: Product rule
Rational exponents: Quotient rule
Rational exponents: Products and quotients with negative exponents
Rational exponents: Power of a power rule
Rational exponents: Powers of powers with negative exponents
Simplifying products or quotients of higher radicals with different indices: Univariate

Complex Numbers and Quadratic Equations (39 topics)
Using \( i \) to rewrite square roots of negative numbers
Simplifying a product and quotient involving square roots of negative numbers
Adding or subtracting complex numbers
Multiplying complex numbers
Dividing complex numbers
Simplifying a power of \( i \)
Solving an equation of the form \( x^2 = a \) using the square root property
Solving a quadratic equation using the square root property: Exact answers, basic
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Solving a word problem using a quadratic equation with irrational roots
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Translating the graph of a parabola: One step
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Graphing a parabola of the form \( y = x^2 + bx + c \)
Graphing a parabola of the form \( y = ax^2 + bx + c \): Integer coefficients
Graphing a parabola of the form \( y = ax^2 + bx + c \): Rational coefficients
Finding the \( x \)−intercept(s) and the vertex of a parabola
Rewriting a quadratic function to find the vertex of its graph
Finding the maximum or minimum of a quadratic function
Word problem involving the maximum or minimum of a quadratic function
Domain and range from the graph of a parabola
Range of a quadratic function
Solving a quadratic equation by graphing
Comparing properties of quadratic functions given in different forms
Classifying the graph of a function
How the leading coefficient affects the shape of a parabola
Identifying linear, quadratic, and exponential functions given ordered pairs
Graphing a cubic function of the form \( y = ax^3 \)
Sum, difference, and product of two functions
Composition of two functions: Basic
Expressing a function as a composition of two functions
Determining whether an equation defines a function: Basic
Determining whether an equation defines a function: Advanced
*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.*