



## *Prep for GED Mathematics*

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 Show All (643 topics + 442 additional topics)

- Whole Numbers and Integers (115 topics)
  - ◆ Place Value and Numeral Translation (7 topics)
    - ◇ Whole number place value: Problem type 1
    - ◇ Whole number place value: Problem type 2
    - ◇ Numeral translation: Problem type 1
    - ◇ Numeral translation: Problem type 2
    - ◇ Expanded form: 2 and 3-digit numbers
    - ◇ Expanded form: 4 and 5-digit numbers
    - ◇ Expanded form with zeros
  - ◆ Addition and Subtraction with Whole Numbers (18 topics)
    - ◇ 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 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 of 2-digit numbers without regrouping
    - ◇ Subtracting a 1-digit number from a 2-digit number
    - ◇ Subtraction involving 3-digit numbers without regrouping
    - ◇ Subtraction of 2-digit numbers with regrouping
    - ◇ Subtraction with multiple regrouping steps involving 3-digit numbers
    - ◇ 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
    - ◇ Perimeter of a polygon
    - ◇ Perimeter of a square or a rectangle
  - ◆ Multiplication and Division with Whole Numbers (27 topics)
    - ◇ Multiplying a 1-digit number by 6, 7, 8, or 9
    - ◇ Multiplying 2-digit and 1-digit numbers without regrouping
    - ◇ Multiplication by 10, 100, and 1000
    - ◇ Multiplication with trailing zeros: Problem type 1
    - ◇ Multiplying 2-digit and 1-digit numbers with regrouping: Problem type 2
    - ◇ Multiplying multi-digit and 1-digit numbers with regrouping
    - ◇ Area of a rectangle with two-digit by one-digit side lengths
    - ◇ Introduction to multiplication of large numbers
    - ◇ Multiplication of large numbers
    - ◇ Multiplication with trailing zeros: Problem type 2

- ◊ 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
- ◊ Division involving quotients with intermediate zeros: Problem type 1
- ◊ Division with trailing zeros: Problem type 2
- ◊ Whole number division: 3–digit by 2–digit, no remainder
- ◊ Word problem with division of whole numbers and rounding: Problem type 1
- ◊ Word problem with division of whole numbers and rounding: Problem type 2
- ◆ Ordering and Estimation (10 topics)
  - ◊ Introduction to inequalities
  - ◊ Ordering large numbers
  - ◊ Rounding to tens or hundreds
  - ◊ Rounding to hundreds or thousands
  - ◊ 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
  - ◊ Estimating a quotient
- ◆ Exponents and Order of Operations (9 topics)
  - ◊ Writing expressions using exponents
  - ◊ Introduction to exponents
  - ◊ Power of 10: Positive exponent
  - ◊ Introduction to parentheses
  - ◊ Introduction to order of operations
  - ◊ 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
- ◆ Prime Numbers, Factors, and Multiples (8 topics)
  - ◊ Even and odd numbers
  - ◊ Factors
  - ◊ Prime numbers
  - ◊ Prime factorization
  - ◊ Greatest common factor of 2 numbers
  - ◊ Greatest common factor of 3 numbers
  - ◊ Least common multiple of 2 numbers
  - ◊ Least common multiple of 3 numbers
- ◆ Plotting and Ordering Integers (4 topics)
  - ◊ Plotting integers on a number line
  - ◊ Ordering integers
  - ◊ Writing a signed number for a real–world situation
  - ◊ Absolute value of a number
- ◆ Addition and Subtraction with Integers (10 topics)

- ◊ Integer addition: Problem type 1
- ◊ Integer addition: Problem type 2
- ◊ Identifying relative change when combining two quantities
- ◊ Integer subtraction: Problem type 1
- ◊ Integer subtraction: Problem type 2
- ◊ Integer subtraction: Problem type 3
- ◊ Addition and subtraction with 3 integers
- ◊ Word problem with addition or subtraction of integers
- ◊ Operations with absolute value: Problem type 1
- ◊ Computing the distance between two integers on a number line
- ◆ Multiplication and Division with Integers (5 topics)
  - ◊ Integer multiplication and division
  - ◊ Multiplication of 3 or 4 integers
  - ◊ Word problem with multiplication or division of integers
  - ◊ Exponents and integers: Problem type 1
  - ◊ Order of operations with integers
- ◆ Evaluating and Writing Expressions (10 topics)
  - ◊ Evaluating an algebraic expression: Whole number addition or subtraction
  - ◊ Evaluating an algebraic expression: Whole number multiplication or division
  - ◊ 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
  - ◊ 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
- ◆ One-Step Equations (7 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 integers
  - ◊ Multiplicative property of equality with whole numbers
  - ◊ Multiplicative property of equality with integers
  - ◊ Translating a sentence into a one-step equation
- Fractions (42 topics)
  - ◆ Equivalent Fractions (8 topics)
    - ◊ Understanding non-unit fractions
    - ◊ Understanding equivalent fractions with shapes containing up to 8 equal parts
    - ◊ Conversions involving division in fractional form and whole numbers
    - ◊ 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 Fractions (4 topics)
    - ◊ Identifying a fraction on a number line
    - ◊ Plotting fractions on a number line
    - ◊ Comparing fractions with the same denominator
    - ◊ Comparing fractions by finding a common denominator
  - ◆ Mixed Numbers and Improper Fractions (4 topics)
    - ◊ Writing an improper fraction as a mixed number
    - ◊ Writing a mixed number as an improper fraction

- ◇ Position of mixed numbers on a number line
  - ◇ Plotting mixed numbers on a number line
- ◆ Addition and Subtraction with Fractions (7 topics)
  - ◇ Addition or subtraction of fractions with the same denominator
  - ◇ Addition or subtraction of fractions with the same denominator and simplification
  - ◇ Introduction to adding fractions with variables and common denominators
  - ◇ Finding the LCD of two fractions
  - ◇ Writing fractions with a common denominator to add or subtract
  - ◇ Addition or subtraction of fractions with different denominators
  - ◇ Signed fraction addition or subtraction: Basic
- ◆ Multiplication and Division with Fractions (11 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
  - ◇ Signed fraction multiplication: Basic
  - ◇ Word problem involving fractions and multiplication
  - ◇ Multi-step word problem involving fractions and multiplication
  - ◇ The reciprocal of a number
  - ◇ Division involving a whole number and a fraction
  - ◇ Fraction division
- ◆ Exponents and Order of Operations (4 topics)
  - ◇ Exponents and fractions
  - ◇ Evaluating expressions with exponents of zero
  - ◇ Order of operations with fractions: Problem type 1
  - ◇ Complex fraction without variables: Problem type 1
- ◆ Expressions and One-Step Equations (4 topics)
  - ◇ Additive property of equality with signed fractions
  - ◇ Multiplicative property of equality with whole numbers: Fractional answers
  - ◇ Multiplicative property of equality with fractions
  - ◇ Multiplicative property of equality with signed fractions
- Decimals (46 topics)
  - ◆ Place Value and Ordering (7 topics)
    - ◇ Decimal place value: Tenths and hundredths
    - ◇ Decimal place value: Hundreds to ten thousandths
    - ◇ Reading decimal position on a number line: Tenths
    - ◇ Reading decimal position on a number line: Hundredths
    - ◇ Introduction to ordering decimals
    - ◇ Ordering decimals
    - ◇ Rounding decimals
  - ◆ Converting Decimals to Fractions (3 topics)
    - ◇ Converting a decimal to a proper fraction without simplifying: Basic
    - ◇ Converting a decimal to a proper fraction in simplest form: Basic
    - ◇ Converting a decimal to a proper fraction in simplest form: Advanced
  - ◆ Addition and Subtraction (11 topics)
    - ◇ Addition of decimals: Vertically aligned
    - ◇ Decimal addition with 2 numbers
    - ◇ Decimal addition with 3 numbers
    - ◇ Subtraction of aligned decimals
    - ◇ Decimal subtraction: Basic
    - ◇ Decimal subtraction: Advanced
    - ◇ Estimating a decimal sum or difference

- ◊ Signed decimal addition and subtraction
- ◊ Finding a point on a number line given the length of a segment and another point
- ◊ Word problem with addition or subtraction of 2 decimals
- ◊ Word problem with addition of 3 or 4 decimals and whole numbers
- ◆ Multiplication (9 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
  - ◊ Multiplication of a decimal by a power of 0.1
  - ◊ Signed decimal multiplication
  - ◊ Word problem with multiplication of a decimal and a whole number
  - ◊ Word problem with multiple decimal operations: Problem type 1
- ◆ Division (6 topics)
  - ◊ Division of a decimal by a power of ten
  - ◊ Whole number division with decimal answers
  - ◊ Division of a decimal by a whole number
  - ◊ Division of a decimal by a 1–digit decimal: Problem type 1
  - ◊ Division of a decimal by a 2–digit decimal
  - ◊ Word problem with division of a decimal and a whole number
- ◆ Converting Fractions to Decimals (8 topics)
  - ◊ Converting a fraction with a denominator of 10 or 100 to a decimal
  - ◊ Converting a fraction with a denominator of 100 or 1000 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
  - ◊ 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
- ◆ Expressions and One–Step Equations (2 topics)
  - ◊ Additive property of equality with decimals
  - ◊ Multiplicative property of equality with decimals
- Ratios, Proportions, and Measurement (26 topics)
  - ◆ Ratios and Unit Rates (11 topics)
    - ◊ Writing ratios using different notations
    - ◊ Writing ratios for real–world situations
    - ◊ Identifying statements that describe a ratio
    - ◊ Simplifying a ratio of whole numbers: Problem type 1
    - ◊ Finding a unit price
    - ◊ Using tables to compare ratios
    - ◊ Computing unit prices to find the better buy
    - ◊ Solving a word problem on proportions using a unit rate
    - ◊ Solving a one–step word problem using the formula  $d = rt$
    - ◊ Finding missing values in a table expressing a constant rate
    - ◊ Using a table of equivalent ratios to find a missing quantity in a ratio
  - ◆ Proportions (4 topics)
    - ◊ Solving a proportion of the form  $x/a=b/c$ : Basic
    - ◊ Solving a proportion of the form  $x/a = b/c$
    - ◊ Word problem on proportions: Problem type 1
    - ◊ Word problem on proportions: Problem type 2
  - ◆ Similar Figures (3 topics)
    - ◊ Finding a missing side length given two similar triangles

- ◊ Similar polygons
  - ◊ Indirect measurement
- ◆ Scale Factors and Scale Drawings (2 topics)
  - ◊ Finding lengths using scale models
  - ◊ Finding a scale factor: Same units
- ◆ U.S. Customary Units of Measurement (4 topics)
  - ◊ U.S. Customary length conversion with whole number values
  - ◊ U.S. Customary length conversions involving rounding decimals
  - ◊ U.S. Customary volume conversion with whole number values
  - ◊ U.S. Customary weight conversions with whole number values
- ◆ Time and Temperature (1 topics)
  - ◊ Converting between temperatures in Fahrenheit and Celsius
- ◆ Converting Between Systems and Dimensional Analysis (1 topics)
  - ◊ Converting between metric and U.S. Customary unit systems
- Percents (28 topics)
  - ◆ Understanding Percents (2 topics)
    - ◊ Converting a fraction with a denominator of 100 to a percentage
    - ◊ Converting a percentage to a fraction with a denominator of 100
  - ◆ Percents, Decimals, and Fractions (9 topics)
    - ◊ 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
    - ◊ Writing a ratio as a percentage
    - ◊ Finding the rate of a tax or commission
  - ◆ Percent of a Number (6 topics)
    - ◊ Finding a percentage of a whole number
    - ◊ Finding a percentage of a whole number without a calculator: Basic
    - ◊ 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
    - ◊ Finding a percentage of a total amount in a circle graph
  - ◆ Percent Equations (3 topics)
    - ◊ Applying the percent equation: Problem type 1
    - ◊ Finding the total amount given the percentage of a partial amount
    - ◊ Interpreting a circle graph or pie chart
  - ◆ Percent Increase and Decrease (6 topics)
    - ◊ 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 total cost including tax or markup
    - ◊ Finding the original amount given the result of a percentage increase or decrease
    - ◊ Finding the percentage increase or decrease: Basic
    - ◊ Finding the percentage increase or decrease: Advanced
  - ◆ Personal Finances (2 topics)
    - ◊ Finding the interest and future value of a simple interest loan or investment
    - ◊ Computing percentages for categories of a budget
- Linear Equations and Inequalities (74 topics)
  - ◆ The Distributive Property (4 topics)
    - ◊ Multiplying a constant and a linear monomial
    - ◊ Distributive property: Whole number coefficients

- ◊ Distributive property: Integer coefficients
- ◊ Distributive property: Fractional coefficients
- ◆ Simplifying Algebraic Expressions (12 topics)
  - ◊ Introduction to properties of addition
  - ◊ Combining like terms: Whole number coefficients
  - ◊ Properties of addition
  - ◊ Introduction to properties of multiplication
  - ◊ Properties of real numbers
  - ◊ Combining like terms: Integer coefficients
  - ◊ Combining like terms: Decimal coefficients
  - ◊ Combining like terms: Fractional coefficients
  - ◊ Identifying equivalent algebraic expressions
  - ◊ 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
- ◆ Multi-Step Equations (14 topics)
  - ◊ Identifying solutions to a linear equation in one variable: Two-step equations
  - ◊ Using two steps to solve an equation with whole numbers
  - ◊ Solving a two-step equation with integers
  - ◊ Solving an equation to find the value of an expression
  - ◊ 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
  - ◊ Clearing fractions in an equation
  - ◊ Solving a two-step equation with signed fractions
  - ◊ Solving a proportion of the form  $(x+a)/b = c/d$
  - ◊ Introduction to solving a rational equation
  - ◊ Solving a rational equation that simplifies to linear: Denominator  $x$
- ◆ Equations with Variables on Both Sides (6 topics)
  - ◊ 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 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 Formulas for a Variable (3 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 multiplication or division: Advanced
- ◆ Applications of Equations (10 topics)
  - ◊ Translating a sentence into a multi-step equation
  - ◊ Writing an equation of the form  $Ax + B = C$  to solve a word problem
  - ◊ Comparing arithmetic and algebraic solutions to 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
  - ◊ 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 percent mixture problem using a linear equation
  - ◊ Solving a distance, rate, time problem using a linear equation
- ◆ Writing and Graphing Inequalities (8 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
  - ◊ 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
- ◆ One-Step Inequalities (7 topics)
  - ◊ Identifying solutions to a one-step linear inequality
  - ◊ 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 whole numbers
  - ◊ Multiplicative property of inequality with integers
  - ◊ Multiplicative property of inequality with signed fractions
- ◆ Multi-Step Inequalities (8 topics)
  - ◊ 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 a linear inequality with multiple occurrences of the variable: Problem type 3
  - ◊ Solving a compound linear inequality: Graph solution, basic
- ◆ Applications of Inequalities (2 topics)
  - ◊ Solving a word problem using a one-step linear inequality
  - ◊ Solving a word problem using a two-step linear inequality
- Lines and Systems of Linear Equations (60 topics)
  - ◆ Ordered Pairs (6 topics)
    - ◊ 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 distances between points that share a common coordinate given their coordinates
    - ◊ Midpoint of a line segment in the plane
    - ◊ Finding an endpoint of a line segment given the other endpoint and the midpoint
  - ◆ Tables and Graphs of Lines (15 topics)
    - ◊ 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 a solution to a linear equation in two variables
    - ◊ 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
- ◊ Identifying parallel and perpendicular lines
- ◊ Interpreting a line graph
- ◆ Proportional Relationships (6 topics)
  - ◊ Writing an equation to represent a proportional relationship
  - ◊ Identifying proportional relationships in equations
  - ◊ Identifying proportional relationships in tables by calculating unit rates: Whole numbers
  - ◊ Identifying proportional relationships in graphs: Basic
  - ◊ 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
- ◆ Slope (3 topics)
  - ◊ 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
- ◆ Equations of Lines (10 topics)
  - ◊ 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  $Ax + By = C$
  - ◊ Writing an equation of a line given its slope and y-intercept
  - ◊ 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
  - ◊ Writing the equation of a line given the y-intercept and another point
  - ◊ Writing the equation of a line through two given points
  - ◊ 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 (7 topics)
  - ◊ Writing and evaluating a function that models a real-world situation: Basic
  - ◊ Writing and evaluating a function that models 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 next terms of an arithmetic sequence with whole numbers
  - ◊ Finding the next terms of an arithmetic sequence with integers
  - ◊ Finding the next terms of a geometric sequence with whole numbers
- ◆ Systems of Linear Equations (13 topics)
  - ◊ Identifying solutions to a system of linear equations
  - ◊ Graphically solving a system of linear equations both of the form  $y=mx+b$
  - ◊ Introduction to using substitution to solve a linear equation
  - ◊ 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
  - ◊ 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 value mixture problem using a system of linear equations
  - ◊ Solving a distance, rate, time problem using a system of linear equations
  - ◊ Solving a percent mixture problem using a system of linear equations
- Exponents and Polynomial Expressions (56 topics)
  - ◆ Product, Power, and Quotient Rules (13 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
- ◊ Simplifying a ratio of multivariate monomials: Basic
- ◊ Introduction to the quotient rule with positive exponents: Whole number base
- ◊ 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
- ◆ Negative Exponents (5 topics)
  - ◊ Evaluating an expression with a negative exponent: Whole number base
  - ◊ Evaluating an expression with a negative exponent: Positive fraction base
  - ◊ Introduction to the product rule with negative exponents: Whole number base
  - ◊ 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
- ◆ Scientific Notation (6 topics)
  - ◊ 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
  - ◊ Multiplying numbers written in scientific notation: Basic
- ◆ Polynomial Expressions (16 topics)
  - ◊ Degree and leading coefficient of a univariate polynomial
  - ◊ Simplifying a sum or difference of two univariate 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
  - ◊ Introduction to the GCF of two monomials
  - ◊ Greatest common factor of two multivariate monomials
  - ◊ Dividing a polynomial by a monomial: Univariate
- ◆ Factoring (12 topics)
  - ◊ Factoring a linear binomial
  - ◊ Factoring out a monomial from a polynomial: Univariate
  - ◊ Factoring out a binomial from a polynomial: GCF factoring, basic
  - ◊ Factoring a univariate polynomial by grouping: Problem type 1
  - ◊ Factoring a quadratic with leading coefficient 1
  - ◊ Factoring a quadratic in two variables with leading coefficient 1
  - ◊ 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 perfect square trinomial with leading coefficient 1
  - ◊ 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

- ◆ Solving Quadratic Equations by Factoring (4 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
- Rational and Radical Expressions (48 topics)
  - ◆ Rational Expressions (3 topics)
    - ◇ Simplifying a ratio of factored polynomials: Linear factors
    - ◇ Simplifying a ratio of polynomials using GCF factoring
    - ◇ Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
  - ◆ Multiplication and Division of Rational Expressions (4 topics)
    - ◇ Multiplying rational expressions involving multivariate monomials
    - ◇ Multiplying rational expressions involving linear expressions
    - ◇ Dividing rational expressions involving multivariate monomials
    - ◇ Dividing rational expressions involving linear expressions
  - ◆ Addition and Subtraction of Rational Expressions (10 topics)
    - ◇ Introduction to the LCM of two monomials
    - ◇ Finding the LCD of rational expressions with linear denominators: Relatively prime
    - ◇ Writing equivalent rational expressions with monomial denominators
    - ◇ Adding rational expressions with common denominators and monomial numerators
    - ◇ Adding rational expressions with common denominators and GCF factoring
    - ◇ Adding rational expressions with common denominators and quadratic factoring
    - ◇ Adding rational expressions with different denominators and a single occurrence of a variable
    - ◇ Adding rational expressions with denominators  $ax$  and  $bx$ : Basic
    - ◇ Adding rational expressions with denominators  $ax^n$  and  $bx^m$
    - ◇ Adding rational expressions with linear denominators without common factors: Basic
  - ◆ Complex Fractions (1 topics)
    - ◇ Complex fraction involving univariate monomials
  - ◆ Equations with Rational Expressions (2 topics)
    - ◇ Solving a rational equation that simplifies to linear: Denominator  $x+a$
    - ◇ Word problem involving multiple rates
  - ◆ Square Roots and Irrational Numbers (6 topics)
    - ◇ Square root of a perfect square
    - ◇ Square root of a rational perfect square
    - ◇ Square roots of perfect squares with signs
    - ◇ Using a calculator to approximate a square root
    - ◇ Estimating a square root
    - ◇ Converting a repeating decimal to a fraction
  - ◆ Simplifying Square Roots (2 topics)
    - ◇ Simplifying the square root of a whole number less than 100
    - ◇ Simplifying the square root of a whole number greater than 100
  - ◆ Higher Roots and Rational Exponents (3 topics)
    - ◇ Cube root of an integer
    - ◇ Simplifying a higher root of a whole number
    - ◇ Rational exponents: Unit fraction exponents and whole number bases
  - ◆ Operations with Square Roots (4 topics)
    - ◇ Introduction to square root addition or subtraction
    - ◇ Square root addition or subtraction
    - ◇ Introduction to square root multiplication
    - ◇ Simplifying a quotient of square roots
  - ◆ Nonlinear Equations (9 topics)
    - ◇ Solving an equation of the form  $x^2 = a$  using the square root property
    - ◇ Finding side lengths of squares given an area and a perimeter

- ◊ Solving a quadratic equation using the square root property: Exact answers, basic
  - ◊ Completing the square
  - ◊ Solving a quadratic equation using the square root property: Exact answers, advanced
  - ◊ Solving a quadratic equation by completing the square: Exact answers
  - ◊ Applying the quadratic formula: Exact answers
  - ◊ Applying the quadratic formula: Decimal answers
  - ◊ Solving a word problem using a quadratic equation with irrational roots
- ◆ Pythagorean Theorem and Distance Formula (4 topics)
  - ◊ Introduction to the Pythagorean Theorem
  - ◊ Pythagorean Theorem
  - ◊ Word problem involving the Pythagorean Theorem
  - ◊ Distance between two points in the plane: Decimal answers
- Functions (35 topics)
  - ◆ Introduction to Functions (11 topics)
    - ◊ Identifying functions from relations
    - ◊ Vertical line test
    - ◊ Table for a linear function
    - ◊ Evaluating functions: Linear and quadratic or cubic
    - ◊ Variable expressions as inputs of functions: Problem type 1
    - ◊ Table for a square root function
    - ◊ Table for an exponential function
    - ◊ 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
    - ◊ Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
    - ◊ Determining whether an equation defines a function: Basic
  - ◆ Graphs of Functions (14 topics)
    - ◊ Finding an output of a function from its graph
    - ◊ 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
    - ◊ 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 of the form  $y = A|x|$
    - ◊ Graphing an absolute value equation in the plane: Basic
    - ◊ 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  $f(x) = ax^2 + c$
    - ◊ Graphing a square root function: Problem type 1
    - ◊ Graphing an exponential function:  $f(x) = b^x$
  - ◆ Combining Functions (3 topics)
    - ◊ Sum, difference, and product of two functions
    - ◊ Introduction to the composition of two functions
    - ◊ Composition of two functions: Basic
  - ◆ More on Quadratic Functions (7 topics)
    - ◊ Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
    - ◊ Graphing a parabola of the form  $y = (x-h)^2 + k$
    - ◊ Graphing a parabola of the form  $y = x^2 + bx + c$
    - ◊ Graphing a parabola of the form  $y = a(x-h)^2 + k$
    - ◊ Graphing a parabola of the form  $y = ax^2 + bx + c$ : Integer coefficients
    - ◊ Finding the maximum or minimum of a quadratic function

- ◊ Word problem involving the maximum or minimum of a quadratic function
- Lines, Angles, and Polygons (26 topics)
  - ◆ Lines and Angles (9 topics)
    - ◊ Acute, obtuse, and right angles
    - ◊ Measuring an angle with the protractor
    - ◊ Introduction to angle addition
    - ◊ Finding an angle measure in a figure with a right or straight angle
    - ◊ Finding supplementary and complementary angles
    - ◊ Identifying supplementary and vertical angles
    - ◊ Finding angle measures given two intersecting lines
    - ◊ Identifying corresponding and alternate angles
    - ◊ Finding angle measures given two parallel lines cut by a transversal
  - ◆ Properties of Triangles (9 topics)
    - ◊ Acute, obtuse, and right triangles
    - ◊ Classifying scalene, isosceles, and equilateral triangles by side lengths or angles
    - ◊ 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 side lengths and angle measures of isosceles and equilateral triangles
    - ◊ Finding an angle measure for a triangle sharing a side with another triangle
    - ◊ Using triangle inequality to determine if side lengths form a triangle
  - ◆ Polygons and Quadrilaterals (8 topics)
    - ◊ Drawing and identifying a polygon in the coordinate plane
    - ◊ Determining shared attributes of quadrilaterals
    - ◊ Identifying parallelograms, rectangles, and squares
    - ◊ Properties of quadrilaterals
    - ◊ Finding the coordinates of a point to make a parallelogram
    - ◊ Sum of the angle measures of a quadrilateral
    - ◊ Finding the sum of the interior angle measures of a convex polygon given the number of sides
    - ◊ Finding a missing interior angle measure in a convex polygon
- Perimeter, Area, and Volume (46 topics)
  - ◆ Perimeter and Area of Rectangles (13 topics)
    - ◊ Finding the missing length in a figure
    - ◊ Perimeter of a piecewise rectangular figure
    - ◊ Distinguishing between the area and perimeter of a rectangle
    - ◊ Areas of rectangles with the same perimeter
    - ◊ Solving a two-step word problem involving the area of a rectangle
    - ◊ Finding side lengths of rectangles given one dimension and an area or a perimeter
    - ◊ Word problem on optimizing an area or perimeter
    - ◊ Finding the dimensions of a rectangle given its perimeter and a relationship between sides
    - ◊ Solving a word problem using a quadratic equation with rational roots
    - ◊ Introduction to area of a piecewise rectangular shape
    - ◊ Area of a piecewise rectangular figure
    - ◊ Word problem on finding the area of a piecewise rectangular figure
    - ◊ Area between two rectangles
  - ◆ Area of Parallelograms, Triangles, and Trapezoids (5 topics)
    - ◊ Area of a parallelogram
    - ◊ Area of a triangle
    - ◊ Area involving rectangles and triangles
    - ◊ Finding the area of a right triangle using the Pythagorean Theorem
    - ◊ Area of a trapezoid
  - ◆ Circumference and Area of Circles (8 topics)

- ◊ Introduction to a circle: Diameter, radius, and chord
- ◊ Naming and finding measures of central angles, inscribed angles, and arcs of a circle
- ◊ Circumference of a circle
- ◊ Finding the radius or the diameter of a circle given its circumference
- ◊ Perimeter involving rectangles and circles
- ◊ Circumference and area of a circle
- ◊ Area involving rectangles and circles
- ◊ Area between two concentric circles
- ◆ Volume of Prisms and Cylinders (9 topics)
  - ◊ Classifying solids
  - ◊ 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 piecewise rectangular prism
  - ◊ Word problem involving the volume of a piecewise rectangular prism
  - ◊ Volume of a triangular prism
  - ◊ Volume of a cylinder
  - ◊ Word problem involving the volume of a cylinder
- ◆ Volume of Pyramids, Cones, and Spheres (3 topics)
  - ◊ Volume of a pyramid
  - ◊ Volume of a cone
  - ◊ Volume of a sphere
- ◆ Surface Area (8 topics)
  - ◊ Surface area of a cube or a rectangular prism
  - ◊ Word problem involving the surface area of a rectangular prism
  - ◊ Surface area of a triangular prism
  - ◊ 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
  - ◊ Word problem involving the surface area of rectangular prisms and pyramids
  - ◊ Surface area of a sphere
- Data Analysis and Probability (41 topics)
  - ◆ Collecting Data (3 topics)
    - ◊ Interpreting a tally table
    - ◊ Constructing a frequency distribution for grouped data
    - ◊ Computing a percentage from a table of values
  - ◆ Graphs of Data (9 topics)
    - ◊ Representing data on a dot plot
    - ◊ Representing data on a bar graph
    - ◊ Interpreting data in a bar graph with up to six categories
    - ◊ Making part-to-whole, part-to-part, and equivalence comparisons given a bar graph
    - ◊ Interpreting a double bar graph
    - ◊ Constructing a frequency distribution and a histogram
    - ◊ Interpreting data in a scaled pictograph
    - ◊ Interpreting a pictograph table
    - ◊ Angle measure in a circle graph
  - ◆ Mean, Median, Mode, and Range (7 topics)
    - ◊ Mean of a data set
    - ◊ 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
    - ◊ Mean and median of a data set
    - ◊ Mode of a data set

- ◊ Range of a data set
- ◆ Counting (11 topics)
  - ◊ Interpreting a tree diagram
  - ◊ Introduction to the counting principle
  - ◊ Counting principle
  - ◊ Counting principle with repetition allowed
  - ◊ Factorial expressions
  - ◊ Computing permutations and combinations
  - ◊ Word problem involving permutations
  - ◊ Word problem involving combinations
  - ◊ Introduction to permutations and combinations
  - ◊ Permutations and combinations: Problem type 1
  - ◊ Permutations and combinations: Problem type 2
- ◆ Probability (11 topics)
  - ◊ Classifying likelihood
  - ◊ 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
  - ◊ Understanding likelihood
  - ◊ Probabilities of an event and its complement
  - ◊ Outcomes and event probability
  - ◊ Probabilities involving two rolls of a die
  - ◊ Probability of independent events
  - ◊ Probability of dependent events
- Other Topics Available(\*) (442 additional topics)
  - ◆ Whole Numbers and Integers (16 topics)
    - ◊ Quotient with remainder: 1–digit divisor, 3–digit or 4–digit dividend
    - ◊ Division with remainder and a two–digit divisor: Problem type 1
    - ◊ Division with remainder and a two–digit divisor: Problem type 2
    - ◊ Rounding to thousands, ten thousands, or hundred thousands
    - ◊ Divisibility rules for 2, 5, and 10
    - ◊ Divisibility rules for 3 and 9
    - ◊ Word problem involving the least common multiple of 2 numbers
    - ◊ Word problem with common multiples
    - ◊ Finding all numbers with a given absolute value
    - ◊ Addition and subtraction with 4 or 5 integers
    - ◊ Operations with absolute value: Problem type 2
    - ◊ Computing and understanding distances between integers on a number line
    - ◊ Exponents and integers: Problem type 2
    - ◊ Order of operations with integers and exponents
    - ◊ Evaluating an algebraic expression: Whole number operations and exponents
    - ◊ Distinguishing between expressions and equations
  - ◆ Fractions (43 topics)
    - ◊ Understanding equivalent fractions: Problem type 2
    - ◊ Identifying equivalent signed fractions
    - ◊ Comparing fractions with the same numerator
    - ◊ Writing a mixed number and an improper fraction for a shaded region
    - ◊ Plotting rational numbers on a number line
    - ◊ Decomposing a fraction into a sum of fractions with the same denominator
    - ◊ Word problem involving addition or subtraction of fractions with the same denominator

- ◊ Writing unit fractions with a common denominator to add or subtract
- ◊ Addition and subtraction of 3 fractions with different denominators
- ◊ Signed fraction subtraction involving double negation
- ◊ Signed fraction addition or subtraction: Advanced
- ◊ Addition and subtraction of 3 fractions involving signs
- ◊ Word problem involving addition or subtraction of fractions with different denominators
- ◊ Fractional part of a circle
- ◊ 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
- ◊ Addition and subtraction of 3 mixed numbers with different denominators
- ◊ 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
- ◊ Signed fraction multiplication: Advanced
- ◊ Determining if a quantity is increased or decreased when multiplied by a fraction
- ◊ Division involving a whole number and a unit fraction
- ◊ Signed fraction division
- ◊ 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
- ◊ Exponents and signed fractions
- ◊ Order of operations with fractions: Problem type 2
- ◊ Order of operations with fractions: Problem type 3
- ◊ Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
- ◊ Additive property of equality with fractions and mixed numbers
- ◆ Decimals (35 topics)
  - ◊ Converting a decimal to a proper fraction without simplifying: Advanced
  - ◊ Converting a decimal to a mixed number and an improper fraction without simplifying
  - ◊ 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 and subtraction with 3 or more numbers
  - ◊ Signed decimal addition and subtraction with 3 numbers
  - ◊ Computing distances between decimals on a number line
  - ◊ Word problem with subtraction of a whole number and a decimal: Regrouping with zeros
  - ◊ Decimal multiplication: Problem type 2
  - ◊ Multiplying decimals less than 1: Problem type 2
  - ◊ Estimating a product of decimals
  - ◊ Word problem with multiplication of two decimals
  - ◊ Division of a decimal by a power of 0.1
  - ◊ Decimal division with rounding
  - ◊ Average of two numbers
  - ◊ Signed decimal division

- ◇ Word problem with multiple decimal operations: Problem type 2
- ◇ Word problem with division of two decimals
- ◇ Converting a mixed number with a denominator of 2, 4, or 5 to a decimal
- ◇ Converting a mixed number to a terminating decimal: Basic
- ◇ Converting a mixed number to a terminating decimal: Advanced
- ◇ Ordering fractions and decimals
- ◇ Identifying numbers as integers or non-integers
- ◇ Identifying rational decimal numbers
- ◇ 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
- ◇ 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 a linear expression: Signed decimal addition and subtraction
- ◇ Evaluating a linear expression: Signed decimal multiplication with addition or subtraction
- ◆ Ratios, Proportions, and Measurement (43 topics)
  - ◇ Simplifying a ratio of decimals
  - ◇ Word problem on unit rates associated with ratios of whole numbers: Decimal answers
  - ◇ Word problem on unit rates associated with ratios of fractions
  - ◇ Word problem on unit rates associated with ratios of mixed numbers
  - ◇ Word problem with powers of ten
  - ◇ Identifying congruent shapes on a grid
  - ◇ Identifying similar or congruent shapes on a grid
  - ◇ Similar right triangles
  - ◇ Using a scale drawing to find actual area
  - ◇ Choosing U.S. Customary measurement units
  - ◇ Measuring length to the nearest inch
  - ◇ Measuring the length of an object to the nearest quarter or half inch
  - ◇ Conversions involving measurements in feet and inches
  - ◇ Adding measurements in feet and inches
  - ◇ Word problem involving a U.S. Customary length conversion
  - ◇ U.S. Customary unit conversion with whole number values: Two-step conversion
  - ◇ U.S. Customary unit conversion with mixed number values: One-step conversion
  - ◇ U.S. Customary unit conversion with mixed number values: Two-step conversion
  - ◇ U.S. Customary area unit conversion with whole number values
  - ◇ Choosing metric measurement units
  - ◇ Measuring length to the nearest centimeter
  - ◇ Measuring length to the nearest millimeter
  - ◇ Finding a rate given a pictorial representation of a real-world situation
  - ◇ Metric distance conversion with whole number values
  - ◇ Metric distance conversion with decimal values
  - ◇ Metric mass or volume conversion with whole numbers
  - ◇ Metric conversion with decimal values: Two-step problem
  - ◇ Metric area unit conversion with decimal values
  - ◇ Time unit conversion with whole number values
  - ◇ Word problem involving adding or subtracting time within the hour
  - ◇ Introduction to adding time
  - ◇ Adding time
  - ◇ Word problem on elapsed time more than one hour

- ◊ Word problem on elapsed times crossing a.m. and p.m.
- ◊ Simplifying a ratio of whole numbers: Problem type 2
- ◊ Solving a word problem involving rates and time conversion
- ◊ U.S. Customary length conversions involving dimensional analysis
- ◊ Converting between compound units: Basic
- ◊ 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
- ◊ Conversions with currency
- ◊ Word problem involving conversion between compound units using dimensional analysis
- ◆ Percents (27 topics)
  - ◊ 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 decimal percentage to a fraction
  - ◊ Finding benchmark fractions and percentages for a figure
  - ◊ Converting a fraction to a percentage in a real-world situation
  - ◊ Writing a ratio as a percentage without a calculator
  - ◊ Making a reasonable inference based on proportion statistics
  - ◊ Finding a percentage of a whole number without a calculator: Advanced
  - ◊ Making part-to-part and equivalence comparisons given a circle graph
  - ◊ Applying the percent equation: Problem type 2
  - ◊ Computations from a circle graph
  - ◊ Finding the multiplier to give a final amount after a percentage increase or decrease
  - ◊ Finding the sale price without a calculator given the original price and percent discount
  - ◊ Combined effect of more than one markup or discount
  - ◊ Finding the original price given the sale price and percent discount
  - ◊ Finding the absolute error and percent error of a measurement
  - ◊ Computing the interest and repayment amount for a simple interest loan whose term is given in months or days
  - ◊ Calculating income tax
  - ◊ Comparing discounts
  - ◊ Examining a savings plan for college
  - ◊ Calculations involving paying for college
  - ◊ Hourly gross pay with overtime
  - ◊ Gross pay with commission and salary
  - ◊ Introduction to compound interest
  - ◊ Calculating and comparing simple interest and compound interest
- ◆ Linear Equations and Inequalities (32 topics)
  - ◊ Introduction to the distributive property
  - ◊ Understanding the distributive property
  - ◊ Identifying like terms
  - ◊ Using algebra tiles to determine if two expressions are equivalent
  - ◊ Identifying parts in an algebraic expression
  - ◊ Identifying properties used to simplify an algebraic expression
  - ◊ Additive property of equality with a negative coefficient
  - ◊ Identifying properties used to solve a linear equation
  - ◊ 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 equations with zero, one, or infinitely many solutions
- ◊ Solving a proportion of the form  $a/(x+b) = c/x$
- ◊ Solving for a variable in terms of other variables using addition or subtraction: Advanced
- ◊ 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
- ◊ 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
- ◊ 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 an equation to represent a real-world problem: Variable on both sides
- ◊ Writing and solving a real-world problem given an equation with the variable on both sides
- ◊ 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
- ◊ Introduction to identifying solutions to an inequality
- ◊ Additive property of inequality with whole numbers
- ◊ Identifying solutions to a two-step linear inequality in one variable
- ◊ Solving a compound linear inequality: Graph solution, advanced
- ◊ 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 two-step linear inequality
- ◊ Solving a decimal word problem using a linear inequality with the variable on both sides
- ◆ Lines and Systems of Linear Equations (44 topics)
  - ◊ Naming the quadrant or axis of a point given its graph
  - ◊ 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
  - ◊ Making a table and plotting points given a unit rate
  - ◊ Identifying proportional relationships in tables by calculating unit rates: Fractions
  - ◊ Identifying proportional relationships in graphs: Advanced
  - ◊ Finding slope given the graph of a line in quadrant 1 that models a real-world situation
  - ◊ Classifying slopes given graphs of lines
  - ◊ Using right triangles to find the slope of a line
  - ◊ Finding the coordinate that yields a given slope
  - ◊ Graphing a line given its slope and y-intercept
  - ◊ Graphing a line through a given point with a given slope
  - ◊ Identifying linear equations: Basic
  - ◊ Identifying linear functions given ordered pairs
  - ◊ Rewriting a linear equation in the form  $Ax + By = C$
  - ◊ Graphing a line by first finding its slope and y-intercept
  - ◊ Writing an equation and graphing a line given its slope and y-intercept
  - ◊ Finding the slope and a point on a line given its equation in point-slope form
  - ◊ Graphing 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 equations of vertical and horizontal lines through a given point
  - ◊ Identifying parallel and perpendicular lines from equations
  - ◊ Identifying parallel and perpendicular lines from coordinates
  - ◊ 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
  - ◊ Finding inputs and outputs of a two-step function that models a real-world situation: Two variable equation

- ◇ 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
- ◇ Writing an equation and drawing its graph to model a real-world situation: Advanced
- ◇ 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
- ◇ Finding patterns in shapes
- ◇ Identifying the solution of systems of linear equations from graphs
- ◇ Graphically solving a system of linear equations
- ◇ Writing a system of linear equations given its graph
- ◇ Introduction to solving a 3x3 system of linear equations
- ◇ Solving systems of linear equations with 0, 1, or infinitely many solutions
- ◇ Solving a word problem using a system of linear equations of the form  $Ax + By = C$
- ◇ Solving a word problem using a system of linear equations of the form  $y = mx + b$
- ◇ Solving a word problem using a 3x3 system of linear equations: Problem type 1
- ◆ Exponents and Polynomial Expressions (37 topics)
  - ◇ Understanding the product rule of exponents
  - ◇ Ordering numbers with positive exponents
  - ◇ Understanding the power rules of exponents
  - ◇ Power rules with positive exponents: Multivariate products
  - ◇ Power rules with positive exponents: Multivariate quotients
  - ◇ Power of 10: Negative exponent
  - ◇ Evaluating an expression with a negative exponent: Negative integer base
  - ◇ Ordering numbers with negative exponents
  - ◇ Rewriting an algebraic expression without a negative exponent
  - ◇ Introduction to the product rule with negative exponents
  - ◇ Quotient rule with negative exponents: Problem type 1
  - ◇ Power of a power rule with negative exponents
  - ◇ 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: 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 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
  - ◇ Degree of a multivariate polynomial
  - ◇ Simplifying a sum or difference of three univariate polynomials
  - ◇ Simplifying a sum or difference of multivariate polynomials
  - ◇ Multiplication involving binomials and trinomials in two variables
  - ◇ Greatest common factor of three univariate monomials
  - ◇ Dividing a polynomial by a monomial: Multivariate
  - ◇ Polynomial long division: Problem type 1
  - ◇ Factoring out a monomial from a polynomial: Multivariate
  - ◇ Factoring a univariate polynomial by grouping: Problem type 2
  - ◇ Factoring out a constant before factoring a quadratic
  - ◇ Factoring a perfect square trinomial with leading coefficient greater than 1
  - ◇ Factoring a perfect square trinomial in two variables

- ◊ Factoring a sum or difference of two cubes
- ◆ Rational and Radical Expressions (57 topics)
  - ◊ Restriction on a variable in a denominator: Linear
  - ◊ Simplifying a ratio of polynomials: Problem type 1
  - ◊ Multiplying rational expressions involving quadratics with leading coefficients of 1
  - ◊ Dividing rational expressions involving quadratics with leading coefficients of 1
  - ◊ Least common multiple of two monomials
  - ◊ Finding the LCD of rational expressions with linear denominators: Common factors
  - ◊ Finding the LCD of rational expressions with quadratic denominators
  - ◊ Writing equivalent rational expressions with polynomial denominators
  - ◊ Writing equivalent rational expressions involving opposite factors
  - ◊ Adding rational expressions with denominators  $ax$  and  $bx$ : Advanced
  - ◊ Adding rational expressions with linear denominators without common factors: Advanced
  - ◊ Adding rational expressions with linear denominators with common factors: Basic
  - ◊ Adding rational expressions with denominators  $ax-b$  and  $b-ax$
  - ◊ Adding rational expressions involving different quadratic denominators
  - ◊ Complex fraction without variables: Problem type 2
  - ◊ Complex fraction involving multivariate monomials
  - ◊ Complex fraction: GCF factoring
  - ◊ Complex fraction: Quadratic factoring
  - ◊ Complex fraction made of sums involving rational expressions: Problem type 1
  - ◊ Complex fraction made of sums involving rational expressions: Problem type 2
  - ◊ Complex fraction made of sums involving rational expressions: Problem type 3
  - ◊ Complex fraction made of sums involving rational expressions: Problem type 5
  - ◊ Complex fraction made of sums involving rational expressions: Problem type 6
  - ◊ Solving a rational equation that simplifies to linear: Denominators  $a$ ,  $x$ , or  $ax$
  - ◊ Solving a rational equation that simplifies to linear: Denominators  $ax$  and  $bx$
  - ◊ Solving a rational equation that simplifies to linear: Like binomial denominators
  - ◊ Solving a rational equation that simplifies to linear: Unlike binomial denominators
  - ◊ Solving a work problem using a rational equation
  - ◊ Finding all square roots of a number
  - ◊ Using numerical methods to approximate a square root to the nearest tenth
  - ◊ Using numerical methods to approximate a square root to the nearest hundredth
  - ◊ Approximating the location of irrational numbers on a number line
  - ◊ Ordering real numbers
  - ◊ Identifying true statements about rational and irrational numbers
  - ◊ Identifying numbers as rational or irrational
  - ◊ Constructing a Venn diagram to classify real numbers
  - ◊ Constructing a Venn diagram to describe relationships between sets of real numbers
  - ◊ Introduction to simplifying a radical expression with an even exponent
  - ◊ Square root of a perfect square monomial
  - ◊ 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
  - ◊ Finding  $n^{\text{th}}$  roots of perfect  $n^{\text{th}}$  powers with signs
  - ◊ Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power fraction
  - ◊ Converting between radical form and exponent form
  - ◊ Rational exponents: Non-unit fraction exponent with a whole number base
  - ◊ Square root multiplication: Basic
  - ◊ Square root multiplication: Advanced
  - ◊ Rationalizing a denominator: Quotient involving square roots
  - ◊ Rationalizing a denominator: Square root of a fraction
  - ◊ 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
- ◊ Solving an equation of the form  $x^3 = a$  using integers
- ◊ Using the Pythagorean Theorem repeatedly
- ◊ Using the Pythagorean Theorem to find distance on a grid
- ◊ Distance between two points in the plane: Exact answers
- ◆ Functions (14 topics)
  - ◊ Domain and range from ordered pairs
  - ◊ Variable expressions as inputs of functions: Problem type 2
  - ◊ Domain and range of a linear function that models a real-world situation
  - ◊ Finding intercepts of a nonlinear function given its graph
  - ◊ Finding inputs and outputs of a function from its graph
  - ◊ Domain and range from the graph of a discrete relation
  - ◊ Finding domain and range from a linear graph in context
  - ◊ Graphing an integer function and finding its range for a given domain
  - ◊ Graphing an absolute value equation in the plane: Advanced
  - ◊ Graphing a cubic function of the form  $y = ax^3$
  - ◊ Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
  - ◊ Combining functions to write a new function that models a real-world situation
  - ◊ Comparing properties of quadratic functions given in different forms
  - ◊ Solving a system of linear and quadratic equations
- ◆ Lines, Angles, and Polygons (26 topics)
  - ◊ Naming segments, rays, and lines
  - ◊ Naming angles, sides of angles, and vertices
  - ◊ Solving an equation involving complementary or supplementary angles
  - ◊ Solving equations involving vertical angles
  - ◊ Solving equations involving angles and a pair of parallel lines
  - ◊ Classifying scalene, isosceles, and equilateral triangles by side lengths
  - ◊ Finding angle measures of a triangle given angles with variables
  - ◊ Finding angle measures of an isosceles triangle given angles with variables
  - ◊ Creating triangles from given side lengths: Problem type 1
  - ◊ Creating triangles from given side lengths: Problem type 2
  - ◊ Determining if a triangle is possible based on given angle measures
  - ◊ Sine, cosine, and tangent ratios: Numbers for side lengths
  - ◊ Sine, cosine, and tangent ratios: Variables for side lengths
  - ◊ Using a calculator to approximate sine, cosine, and tangent values
  - ◊ Using the Pythagorean Theorem to find a sine, cosine, or tangent ratio in a right triangle
  - ◊ Understanding trigonometric ratios through similar right triangles
  - ◊ Relationship between the sines and cosines of complementary angles
  - ◊ Using a trigonometric ratio to find a side length in a right triangle
  - ◊ Solving a right triangle
  - ◊ Using trigonometry to find a length in a word problem with one right triangle
  - ◊ Using a trigonometric ratio to find an angle measure in a right triangle
  - ◊ Using trigonometry to find angles of elevation or depression in a word problem
  - ◊ Special right triangles: Decimal answers
  - ◊ Naming polygons
  - ◊ Classifying parallelograms
  - ◊ Finding the number of sides of a convex polygon given the sum of the measures of the interior angles
- ◆ Perimeter, Area, and Volume (39 topics)
  - ◊ Writing algebraic expressions for the perimeter of a figure
  - ◊ Finding a side length given the perimeter and side lengths with variables
  - ◊ Word problem on area involving conversions of U.S. Customary units: Problem type 2
  - ◊ Finding the perimeter or area of a rectangle in the coordinate plane

- ◊ Word problem involving the area between two rectangles
- ◊ Solving a word problem involving area using a one-step linear inequality: Area and lengths
- ◊ Finding the area of a triangle or parallelogram in the coordinate plane
- ◊ Computing an area using the Pythagorean Theorem
- ◊ Identifying chords, secants, and tangents of a circle
- ◊ Circumference ratios
- ◊ Area of a circle
- ◊ Circumference and area of a circle: Exact answers in terms of  $\pi$
- ◊ Distinguishing between the area and circumference of a circle
- ◊ 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  $\pi$
- ◊ Vertices, edges, and faces of a solid
- ◊ Nets of solids
- ◊ Volume of a rectangular prism made of unit cubes
- ◊ Writing equivalent expressions for the volume of a rectangular prism
- ◊ Finding the side length of a cube given its volume
- ◊ Word problem on volume involving conversions of U.S. Customary units
- ◊ Word problem involving the volume of a triangular prism
- ◊ Word problem involving the rate of filling or emptying a cylinder
- ◊ Ratio of volumes
- ◊ Volume of a cone: Exact answers in terms of  $\pi$
- ◊ Word problem involving the volume of a cone
- ◊ Word problem involving the volume of a sphere
- ◊ Surface area of a rectangular prism made of unit cubes
- ◊ Distinguishing between surface area and volume
- ◊ 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
- ◊ 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
- ◊ Surface area of a cylinder: Exact answers in terms of  $\pi$
- ◊ Using a net to find the lateral surface area and total surface area of a pyramid
- ◊ Side lengths, perimeters, and areas of similar polygons
- ◊ Computing ratios of side lengths, surface areas, and volumes for similar solids
- ◆ Data Analysis and Probability (29 topics)
  - ◊ Choosing an appropriate method for gathering data: Problem type 1
  - ◊ Choosing an appropriate method for gathering data: Problem type 2
  - ◊ Introduction to expectation
  - ◊ Calculating relative frequencies in a contingency table
  - ◊ Making part-to-whole, part-to-part, and equivalence comparisons given a dot plot (line plot)
  - ◊ Interpreting a stem-and-leaf plot
  - ◊ Constructing a percent bar graph
  - ◊ Constructing a scatter plot
  - ◊ Sketching the line of best fit
  - ◊ Scatter plots and correlation
  - ◊ Predictions from the line of best fit
  - ◊ Using a model to find the mean
  - ◊ Understanding the mean graphically: Two bars
  - ◊ Understanding the mean graphically: Four or more bars
  - ◊ Finding sample size and comparing samples for estimating the mean
  - ◊ Rejecting unreasonable claims based on average statistics
  - ◊ How changing a value affects the mean and median

- ◇ Choosing the best measure to describe data
- ◇ Comparing measures of center and variation
- ◇ Five–number summary and interquartile range
- ◇ Finding outliers in a data set
- ◇ Probability of selecting one card from a standard deck
- ◇ Experimental and theoretical probability
- ◇ Area as probability
- ◇ Determining a sample space and outcomes for an event: Experiment involving multiple selections
- ◇ Probabilities of a permutation and a combination
- ◇ Computing probability involving the addition rule using a two–way frequency table
- ◇ Computing conditional probability using a large two–way frequency table
- ◇ Probability of intersection or union: Word problems

**\*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.*