Algebra I
Mathematics

Grade(s) 9th - 12th, Duration 1 Year, 1 Credit
Required Course

Course Overview

GENERAL DESCRIPTION: This course is designed to provide students with experience in directed numbers and their applications. Linear equations with both one and two variables will be studied as well as quadratic equations.

HOMEWORK OR READING NECESSARY: Homework will be assigned daily with some class time allotted toward its completion

FORMAT: Each day, some time will be allotted toward discussion of previous assignments, lecture and independent or group work time.

TESTS: Assessments will be given at the end of each unit when the class shows general readiness.

Scope And Sequence

Timeframe	Unit	Instructional Topics
6 Week(s)	Relationships between Quantities	1. 1-1 Variables and Expressions 2. 1-2 Order of Operations 3. 1-3 Properties of Numbers 4. 1-4 The Distributive Property 5. 1-5 Equations 6. 1-6 Relations 7. 1-7 Functions 8. 1-8 Interpreting Graphs of Functions 9. 2-1 Writing Equations 10. 2-2 Solving One-Step Equations 11. 2-3 Multi-Step Equations 12. 2-4 Solving Equations with the Variable on Each Side 13. 2-5 Solving Equations Involving Absolute Value 14. 2-6 Ratios and Proportions 15. 2-7 Percent of Change 16. 2-8 Literal Equations and Dimensional Analysis 17. 2-9 Weighted Averages
12 Week(s)	Linear Relationships	1. 3-1 Graphing Linear Equations 2. 3-2 Solving Linear Equations by Graphing 3. 3-3 Rate of Change and Slope 4. 3-4 Direct Variation 5. 3-5 Arithmetic Sequences as Linear Functions 6. 3-6 Proportional and Nonproportional Relationships 7. 4-1 Graphing Equations in Slope-Intercept Form 8. 4-2 Writing Equations in Slope-Intercept Form 9. 4-3 Writing Equations in Point-Slope Form 10. 4-4 Parallel and Perpendicular Lines 11. 4-5 Scatter Plots and Lines of Fit 12. 4-7 Inverse Linear Functions 13. 5-1 Solving Inequalities by Addition and Subtraction 14. 5-2 Solving Inequalities by Multiplication and Division 15. 5-3 Solving Multi-Step Inequalities 16. 5-4 Solving Compound Inequalities 17. 5-5 Inequalities Involving Absolute Value 18. 5-6 Graphing Inequalities in Two Variables 19. 6-1 Graphing Systems of Equations 20. 6-2 Substitution 21. 6-3 Elimination using Addition and Subtraction 22. 6-4 Elimination Using Multiplication 23. 6-5 Applying Systems of Linear Equations 24. 6-6 Systems of Inequalities

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9 Week(s)	Exponential and Quadratic Relationships	1. 7-1 Multiplication Properties of Exponents 2. 7-2 Division Properties of Exponents 3. 7-3 Rational Exponents 4. 7-4 Scientific Notation 5. 7-5 Exponential Functions 6. 7-6 Growth and Decay 7. 7-7 Geometric Sequences as Exponential Functions 8. 8-1 Adding and Subtracting Polynomials 9. 8-2 Multiplying a Polynomial by a Monomial 10. 8-3 Multiplying Polynomials 11. 8-4 Special Products 12. 8-5 Using the Distributive Property 13. 8-6 Solving Simple Trinomials 14. 8-7 Solving Complex Trinomials 15. 8-8 Difference of Squares 16. 8-9 Perfect Squares 17. 9-1 Graphing Quadratic Functions 18. 9-2 Solving Quadratic Equations by Graphing 19. 9-3 Transformations of Quadratic Functions 20. 9-4 Solving Quadratic Equations by Completing the Square 21. 9-5 Solving Quadratic Equations by using the Quadratic Formula 22. 9-6 Analyzing Functions with Successive Differences 23. 9-7 Special Functions
6 Week(s)	Advanced Functions and Equations	1. 10-1 Square Root Functions 2. 10-2 Simplifying Radical Expressions 3. 10-3 Operations with Radical Expressions 4. 10-4 Radical Equations 5. 10-5 Pythagorean Theorem 6. 10-6 Trig Ratios 7. 11-1 Inverse Variation 8. 11-2 Rational Functions 9. 11-3 Simplifying Rational Expressions 10. 11-4 Multiplying and Dividing Rational Expressions 11. 11-5 Dividing Polynomials 12. 11-6 Adding and Subtracting Rational Expressions 13. 11-7 Mixed Expressions and Complex Fractions
3 Week(s)	Data Analysis	1. 12-1 Samples and Studies 2. 12-2 Statistics and Parameters 3. 12-3 Distributions of Data 4. 12-4 Comparing Sets of Data 5. 12-5 Simulations 6. 12-6 Permutations and Combinations 7. 12-7 Probability of Compound Events 8. 12-8 Probability Distributions

Materials and Resources

SUPPLIES: Each student will be charged a $5 calculator rental feel, unless the student chooses to purchase the calculator required for the class.

Prerequisites

PREREQUISITE: Incoming Freshman must have a C or better in Pre-Algebra to enroll. Must pass Algebra I first semester to continue.

Course Details

Unit: Relationships between Quantities   **Duration:** 6 Week(s)

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Unit Overview

Expressions, Equations, and Functions: Write algebraic expressions. Use the order of operations. Solve equations. Represent and interpret relations and functions. Use function notation. Interpret the graph of functions. (1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8)

Linear Equations: Create equations that describe relationships. Solve linear equations in one variable. Solve proportions. Use formulas to solve real-world problems. (2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9)

Materials and Resources

Textbook

Online resources

Academic Vocabulary

Expressions, Equations and Functions

algebraic expression

bae

coefficient

coordinate system

dependent variables

domain

end behavior

equation exponent

function

indepedent variable

intercept

like terms

line symmetry

mapping

ordered pair

order of operations

origin

power

range

reciprocal

relation

relative maximum

relative minimum

replacement set

simplest form

solution

term

variables

vertical line test

Linear Equations

consecutive integers

dimenstional analysis

equivalent equations

extremes

formula

identity

literal equation

means

multi-step equations

number theory

percent of change

percent of decrease

percent of increase

proportion

rate

ratio

scale

scale model

solve an equation

unit analysis

unit rate

weighted average

Summative Assessment

- Expressions, Equations, and Functions Assessment
- Linear Equations Assessment

Topic: 1-1 Variables and Expressions   **Duration:** 2 Day(s)

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Topic Overview

Write verbal expressions for algebraic expressions. Write algebraic expressions for verbal expressions.

Learning Targets

Write verbal expressions for algebraic expressions. Write algebraic expressions for verbal expressions.

Topic: 1-2 Order of Operations   **Duration:** 2 Day(s)

Topic Overview

Evaluate numerical expression by using the order of operations. Evaluate algebraic expressions by using the order of operations.

Learning Targets

Evaluate numerical expression by using the order of operations. Evaluate algebraic expressions by using the order of operations.

Topic: 1-3 Properties of Numbers   **Duration:** 2 Day(s)

Topic Overview

Recognize the properties of equality and identity. Recognize the properties of commutative and associative.

Learning Targets

Recognize the properties of equality and identity. Recognize the properties of commutative and associative.

Topic: 1-4 The Distributive Property   **Duration:** 2 Day(s)

Topic Overview

Use the distributive property to evaluate expressions. Use the distributive property to simplify expressions.

Learning Targets

Use the distributive property to evaluate expressions. Use the Distributive property to simplify expressions.

Topic: 1-5 Equations   **Duration:** 2 Day(s)

Topic Overview

Solve equations with one variable. Solve equations with two variables.

Learning Targets

Solve equations with one variable. Solve equations with two variables.

Topic: 1-6 Relations   **Duration:** 2 Day(s)

Topic Overview

Represent relations. Interpret graphs of relations.

Learning Targets

Represent relations. Interpret graphs of relations.

Topic: 1-7 Functions   **Duration:** 2 Day(s)

Topic Overview

Determine whether a relation is a function. Find function values.

Learning Targets

Determine whether a relation is a function. Find function values.

Topic: 1-8 Interpreting Graphs of Functions   **Duration:** 2 Day(s)

Topic Overview

Interpret intercepts and symmetry of graphs of functions.

Learning Targets

Interpret intercepts and symmetry of graphs of functions.

Topic: 2-1 Writing Equations   **Duration:** 2 Day(s)

Topic Overview

Translate sentences into equations. Translate equations into sentences.

Learning Targets

Translate sentences into equations. Translate equations into sentences.

Topic: 2-2 Solving One-Step Equations   **Duration:** 2 Day(s)

Topic Overview

Solve equations by using addition and subtraction. Solve equations by using multiplication and division.

Learning Targets

Solve equations by using addition and subtraction. Solve equations by using multiplication and division.

Topic: 2-3 Multi-Step Equations   **Duration:** 2 Day(s)

Topic Overview

Solve equations involving more than one operation, Solve equations involving consecutive integers.

Learning Targets

Solve equations involving more than one operation, Solve equations involving consecutive integers.

Topic: 2-4 Solving Equations with the Variable on Each Side   **Duration:** 2 Day(s)

Topic Overview

Solve equations with the variable on each side. Solve equations involving grouping symbols.

Learning Targets

Solve equations with the variable on each side. Solve equations involving grouping symbols.

Topic: 2-5 Solving Equations Involving Absolute Value   **Duration:** 2 Day(s)

Topic Overview

Evaluate absolute value expressions. Solve absolute value equations.

Learning Targets

Evaluate absolute value expressions. Solve absolute value equations.

Topic: 2-6 Ratios and Proportions   **Duration:** 2 Day(s)

Topic Overview

Compare ratios. Solve proportions.

Learning Targets

Compare ratios. Solve proportions.

Topic: 2-7 Percent of Change   **Duration:** 2 Day(s)

Topic Overview

Find the percent of change. Solve problems involving percent of change.

Learning Targets

Find the percent of change. Solve problems involving percent of change.

Topic: 2-8 Literal Equations and Dimensional Analysis   **Duration:** 2 Day(s)

Topic Overview

Solve equations for given variables. Use formulas to solve real-world problems.

Learning Targets

Solve equations for given variables. Use formulas to solve real-world problems.

Topic: 2-9 Weighted Averages   **Duration:** 2 Day(s)

Topic Overview

Solve mixture problems. Solve uniform motion problems.

Learning Targets

Solve mixture problems. Solve uniform motion problems.

Unit: Linear Relationships   **Duration:** 12 Week(s)

Unit Overview

Linear Functions: Identify linear equaitons, intercepts and zeros. Graph and write linear equaitons. Use rate of change to solve problems. (3-1, 3-2, 3-3, 3-4, 3-5, 3-6)

Equations of Linear Functions: Write and graph linear equations in various forms. Use scatter plots and lines of fit, and write equations of best-fit lines using linear regressions. Find inverse linear functions. (4-1, 4-2, 4-3, 4-4, 4-5, 4-7)

Linear Inequalities: Solve one-step and multi-step inequalities. Solve compound inequalities and inequalities involving absolute value. Graph inequalities in two variables. (5-1, 5-2, 5-3, 5-4, 5-5, 5-6)

Systems of Linear Equations and Inequallities: Solve systems of linear equations by graphing, substitution, and elimination. Solve system of linear inequalities by graphing. (6-1, 6-2, 6-3, 6-4, 6-5, 6-6)

Materials and Resources

Textbook
Online resources

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Academic Vocabulary

Linear Functions
arithmetic sequence
common difference
constant
constant of variation
deductive reasoning
direct variation
inductive reasoning
linear equation
linear function
rate of change
root sequence
slope
standard form
terms of the sequence
x-intercept
y-intercept
zero of a function
Equations of Linear Functions
best-fit line
bivariate data
constant function
constraint
correlation coefficient
identity function
inverse function
inverse relation
linear extrapolation
linear interpolation
linear regression
line of fit
median-fit line
parallel lines
perpendicular lines
point-slope form
scatter plot
slope-intercept form
Linear Inequalities
boundary
closed half-plane
compound inequality
half-plane
inequality
intersection
open half-plane
set-builder notation
union
Systems of Linear Equations and Inequalities
stemaugmented matrix
consistent
dependent
dimension
element
elimination
inconsistent
indepedent
matrix
substitution
systems of equations
system of inequalities

Summative Assessment
- Linear Functions Assessment
- Equations of Linear Functions Assessment
- Linear Inequalities Assessment
- Systems of Linear Equations and Inequalities Assessment

Topic: 3-1 Graphing Linear Equations   **Duration:** 2 Day(s)

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Topic Overview

Identify linear equations, intercepts and zeros. Graph linear equations.

Learning Targets

Identify linear equations, intercepts and zeros. Graph linear equations.

Topic: 3-2 Solving Linear Equations by Graphing

Duration: 2 Day(s)

Topic Overview

Solve linear equations by graphing. Estimate solutions to a linear equation by graphing.

Learning Targets

Solve linear equations by graphing. Estimate solutions to a linear equation by graphing.

Topic: 3-3 Rate of Change and Slope

Duration: 2 Day(s)

Topic Overview

Use rate of change to solve problems. Find the slope of a line.

Learning Targets

Use rate of change to solve problems. Find the slope of a line.

Topic: 3-4 Direct Variation

Duration: 2 Day(s)

Topic Overview

Write and graph direct variation equations. Solve problems involving direct variation.

Learning Targets

Write and graph direct variation equations. Solve problems involving direct variation.

Topic: 3-5 Arithmetic Sequences as Linear Functions

Duration: 2 Day(s)

Topic Overview

Recognize arithmetic sequences. Relate arithmetic sequences to linear functions.

Learning Targets

Recognize arithmetic sequences. Relate arithmetic sequences to linear functions.

Topic: 3-6 Proportional and Nonproportional Relationships

Duration: 2 Day(s)

Topic Overview

Write an equation for a proportional relationship. Write an equation for a nonproportional relationship.

Learning Targets

Write an equation for a proportional relationship. Write an equation for a nonproportional relationship.

Topic: 4-1 Graphing Equations in Slope-Intercept Form

Duration: 2 Day(s)

Topic Overview

Write and graph linear equations in slope-intercept form. Model real-world data with equations in slope-intercept form.

Learning Targets

Write and graph linear equations in slope-intercept form. Model real-world data with equations in slope-intercept form.

Topic: 4-2 Writing Equations in Slope-Intercept Form

Duration: 2 Day(s)

Topic Overview

Write an equation of a line in slope-intercept form given the slope and one point. Write an equation of a line in slope-intercept form given two points.

Learning Targets

Write an equation of a line in slope-intercept form given the slope and one point. Write an equation of a line in slope-intercept form given two points.

Topic: 4-3 Writing Equations in Point-Slope Form   **Duration:** 2 Day(s)

Topic Overview

Write equatios of lines in point-slope form. Write linear equations in different forms.

Learning Targets

Write equations of lines in point-slope form. Write linear equations in different forms.

Topic: 4-4 Parallel and Perpendicular Lines   **Duration:** 2 Day(s)

Topic Overview

Write an equation of the line that passes through a given point, parallel to a given line. Write an equation of a line that passes through a given point, perpendicular to a given line.

Learning Targets

Write an equation of the line that passes through a given point, parallel to a given line. Write an equation of a line that passes through a given point, perpendicular to a given line.

Topic: 4-5 Scatter Plots and Lines of Fit   **Duration:** 2 Day(s)

Topic Overview

Investigate relationships between quantities by using points on scatter plots. Use lines of fit to make and evaluate predictions.

Learning Targets

Investigate relationships between quantities by using points on scatter plots. Use lines of fit to make and evaluate predictions.

Topic: 4-7 Inverse Linear Functions   **Duration:** 2 Day(s)

Topic Overview

Find the inverse of a relation. Find the inverse of a linear function.

Learning Targets

Find the inverse of a relation. Find the inverse of a linear function.

Topic: 5-1 Solving Inequalities by Addition and Subtraction   **Duration:** 2 Day(s)

Topic Overview

Solve linear inequalities by using addition and subtraction.

Learning Targets

Solve linear inequalities by using addition and subtraction.

Topic: 5-2 Solving Inequalities by Multiplication and Division   **Duration:** 2 Day(s)

Topic Overview

Solve linear inequalites by using multiplication and division.

Learning Targets

Solve linear inequalites by using multiplication and division.

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Topic: 5-3 Solving Multi-Step Inequalities	**Duration:** 2 Day(s)

Topic Overview

Solve linear inequalities involving more than one operation including the Distributive Property.

Learning Targets

Solve linear inequalities involving more than one operation including the Distributive Property.

Topic: 5-4 Solving Compound Inequalities	**Duration:** 2 Day(s)

Topic Overview

Solve compound inequalities containing the word AND and graph that solution set. Solve compound inequalities containing the word OR and graph that solution set.

Learning Targets

Solve compound inequalities containing the word AND and graph that solution set. Solve compound inequalities containing the word OR and graph that solution set.

Topic: 5-5 Inequalities Involving Absolute Value	**Duration:** 2 Day(s)

Topic Overview

Solve and graph absolute value inequalities with LESS THAN and GREATER THAN.

Learning Targets

Solve and graph absolute value inequalities with LESS THAN and GREATER THAN.

Topic: 5-6 Graphing Inequalities in Two Variables	**Duration:** 2 Day(s)

Topic Overview

Graph linear inequalities on the coordinate plane. Solve inequalities by graphing.

Learning Targets

Graph linear inequalities on the coordinate plane. Solve inequalities by graphing.

Topic: 6-1 Graphing Systems of Equations	**Duration:** 2 Day(s)

Topic Overview

Determine the number of solutions a system of linear equations has. Solve systems of linear equations by graphing.

Learning Targets

Determine the number of solutions a system of linear equations has. Solve systems of linear equations by graphing.

Topic: 6-2 Substitution	**Duration:** 2 Day(s)

Topic Overview

Solve systems of equations by using substitution. Solve real-world problems involving systems of equations by using substitution.

Learning Targets

Solve systems of equations by using substitution. Solve real-world problems involving systems of equations by using substitution.

Topic: 6-3 Elimination using Addition and Subtraction	**Duration:** 2 Day(s)

Topic Overview

Solve systems of equations by using elimination by adding and subtracting.

Learning Targets

Solve systems of equations by using elimination by adding and subtracting.

Topic: 6-4 Elimination Using Multiplication	**Duration:** 2 Day(s)

Topic Overview
Solve systems of equations by using elimination with multiplication as well as real-world problems.

Learning Targets
Solve systems of equations by using elimination with multiplication as well as real-world problems.

Topic: 6-5 Applying Systems of Linear Equations	**Duration:** 2 Day(s)

Topic Overview
Determine the best method for solving systems of equations. Apply systems of equations.

Learning Targets
Determine the best method for solving systems of equations. Apply systems of equations.

Topic: 6-6 Systems of Inequalities	**Duration:** 2 Day(s)

Topic Overview
Solve systems of linear inequalities by graphing. Apply systems of linear inequalities.

Learning Targets
Solve systems of linear inequalities by graphing. Apply systems of linear inequalities.

Unit: Exponential and Quadratic Relationships	**Duration:** 9 Week(s)

Unit Overview
Exponents and Exponential Functions: Simplify and perform operations on expressions involving exponents. Extend the properties of integer exponents to rational exponents. Use scientific notation. Graph and use exponential functions. (7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7)

Quadratic Expressions and Equations: Add, subtract, and multiply polynomials. Factor trinomials. Factor differences of squares. Graph quadratic functions. Solve quadratic equations. (8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 8-8, 8-9)

Quadratic Functions and Equations: Solve quadratic equations by graphing, completing the square and using the Quadratic formula. Analyze functions with successive differences and ratios. Identify and graph special functions. (9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7)

Materials and Resources
Textbook
Online Resources

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Academic Vocabulary
•Exponents and Exponential Functions
common ratio
compound interest
constant
cube root
exponential decay
exponential equation
exponential function
exponential growth
geometric sequence
monomial
negative exponent
nth root
order of magnitude
rational exponent
recursive formula
scientific notation
zero exponent
•Quadratic Expressions and Equations
binomial
degree of monomial
degree of a polynomial
difference of two squares
factoring
factoring by groupoin
FOIL method
leading coefficent
perfect square trinomial
polynomial
prime polynomial
quadratic equation
quadratic expression
Square Root property
standard form of a polynomial
trinomial
Zero Product Property
•Quadratic Functions and Equations
absolute value function
axis of symmetry
completing the square
dilation
discriminant
double root
greatest integer function
maximum
minimum
parabola
piecewise-defined function
piecewise-linear function
Quadratic Formula
quadratic function
reflection
standard form
step function
transformation
translation
vertex

Summative Assessment
- Exponents and Exponential Functions Assessment
- Quadratic Expressions and Equations Assessment
- Quadratic Functions and Equations Assessment

Topic: 7-1 Multiplication Properties of Exponents   **Duration:** 2 Day(s)

Topic Overview
   Multiply monomials using the properties of exponents. Simplify expressions using the multiplication properties of exponents.

Learning Targets

Multiply monomials using the properties of exponents. Simplify expressions using the multiplication properties of exponents.

Topic: 7-2 Division Properties of Exponents   **Duration:** 2 Day(s)

Topic Overview
Divide monomials using the properties of exponents. Simplify expressions containing negative and zero exponents.

Learning Targets
Divide monomials using the properties of exponents. Simplify expressions containing negative and zero exponents.

Topic: 7-3 Rational Exponents   **Duration:** 2 Day(s)

Topic Overview
Evaluate and rewrite expressions involving rational exponents. Solve equations involving expressions with rational exponents.

Learning Targets
Evaluate and rewrite expressions involving rational exponents. Solve equations involving expressions with rational exponents.

Topic: 7-4 Scientific Notation   **Duration:** 2 Day(s)

Topic Overview
Express numbers in scientific notation. Find products and quotients of numbers expressed in scientific notation.

Learning Targets
Express numbers in scientific notation. Find products and quotients of numbers expressed in scientific notation.

Topic: 7-5 Exponential Functions   **Duration:** 2 Day(s)

Topic Overview
Graph exponential functions. Identify data that display exponential behavior.

Learning Targets
Graph exponential functions. Identify data that display exponential behavior.

Topic: 7-6 Growth and Decay   **Duration:** 2 Day(s)

Topic Overview
Solve problems involving exponential growth and decay.

Learning Targets
Solve problems involving exponential growth and decay.

Topic: 7-7 Geometric Sequences as Exponential Functions   **Duration:** 2 Day(s)

Topic Overview
Identify and generate geometric sequences. Relate geometric sequences to exponential functions.

Learning Targets
Identify and generate geometric sequences. Relate geometric sequences to exponential functions.

Topic: 8-1 Adding and Subtracting Polynomials   **Duration:** 2 Day(s)

Topic Overview
Write polynomials in standard form. Add and subtract polynomials.

Learning Targets
Write polynomials in standard form. Add and subtract polynomials.

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Topic: 8-2 Multiplying a Polynomial by a Monomial	**Duration:** 2 Day(s)

Topic Overview
Multiply a polynomial by a monomial. Solve equations involving the products of monomials and polynomials.

Learning Targets
Multiply a polynomial by a monomial. Solve equations involving the products of monomials and polynomials.

Topic: 8-3 Multiplying Polynomials	**Duration:** 2 Day(s)

Topic Overview
Multiply binomials by using the FOIL method. Multiply polynomials by using the Distributive Property.

Learning Targets
Multiply binomials by using the FOIL method. Multiply polynomials by using the Distributive Property.

Topic: 8-4 Special Products	**Duration:** 2 Day(s)

Topic Overview
Find squares of sums and differences. Find the product of a sum and a difference.

Learning Targets
Find squares of sums and differences. Find the product of a sum and a difference.

Topic: 8-5 Using the Distributive Property	**Duration:** 2 Day(s)

Topic Overview
Use the Distributive Property to factor polynomials. Solve equations of the form ax2 to bx = 0.

Learning Targets
Use the Distributive Property to factor polynomials. Solve equations of the form ax2 to bx = 0.

Topic: 8-6 Solving Simple Trinomials	**Duration:** 2 Day(s)

Topic Overview
Factor simple trinomials. Solving equations with simple trinomials.

Learning Targets
Factor simple trinomials. Solving equations with simple trinomials.

Topic: 8-7 Solving Complex Trinomials	**Duration:** 2 Day(s)

Topic Overview
Factor complex trinomials by factoring by grouping. Solving equations involving complex trinomials.

Learning Targets
Factor complex trinomials by factoring by grouping. Solving equations involving complex trinomials.

Topic: 8-8 Difference of Squares	**Duration:** 2 Day(s)

Topic Overview
Factor binomials that are difference of squares. Use the difference of squares to solve equations.

Learning Targets
Factor binomials that are difference of squares. Use the difference of squares to solve equations.

Topic: 8-9 Perfect Squares	**Duration:** 2 Day(s)

Topic Overview

Factor perfect square trinomials. Solve equations involving perfect squares.

Learning Targets

Factor perfect square trinomials. Solve equations involving perfect squares.

Topic: 9-1 Graphing Quadratic Functions | **Duration:** 2 Day(s)

Topic Overview

Analyze the characteristics of graphs of quadratic functions. Graph quadratic functions.

Learning Targets

Analyze the characteristics of graphs of quadratic functions. Graph quadratic functions.

Topic: 9-2 Solving Quadratic Equations by Graphing | **Duration:** 2 Day(s)

Topic Overview

Solve quadratic equations by graphing. Estimate solution of quadratic equations by graphing.

Learning Targets

Solve quadratic equations by graphing. Estimate solution of quadratic equations by graphing.

Topic: 9-3 Transformations of Quadratic Functions | **Duration:** 2 Day(s)

Topic Overview

Apply transition to quadratic functions. Apply dilations and relfections to quadratic functions.

Learning Targets

Apply transition to quadratic functions. Apply dilations and relfections to quadratic functions.

Topic: 9-4 Solving Quadratic Equations by Completing the Square | **Duration:** 2 Day(s)

Topic Overview

Complete the square to write perfect square trinomials. Solve quadratic equations by completing the square.

Learning Targets

Complete the square to write perfect square trinomials. Solve quadratic equations by completing the square.

Topic: 9-5 Solving Quadratic Equations by using the Quadratic Formula | **Duration:** 2 Day(s)

Topic Overview

Solve quadratic equations by using the quadratic formula. Use the discriminant to determine the number of solutions of a quadratic equation.

Learning Targets

Solve quadratic equations by using the quadratic formula. Use the discriminant to determine the number of solutions of a quadratic equation.

Topic: 9-6 Analyzing Functions with Successive Differences | **Duration:** 2 Day(s)

Topic Overview

Identify linear, quadratic and exponential functions from given data. Write equations that model data.

Learning Targets

Identify linear, quadratic and exponential functions from given data. Write equations that model data.

Topic: 9-7 Special Functions | **Duration:** 2 Day(s)

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Topic Overview
Identify and graph step functions. Identify and graph absolute value and piecewise-defined functions.

Unit: Advanced Functions and Equations   **Duration:** 6 Week(s)

Unit Overview
Radical Functions and Geometry: Graph and transform radical functions. Simplify add, subtract and multiply rational expressions. Solve radical equations. Use the Pythagorean Theorem. Find trigonometric ratios. (10-1, 10-2, 10-3, 10-4, 10-5, 10-6)

Rational Functions and Equations: Identify and graph inverse variations. Identify excluded values of rational functions. Multiply, divide and add rational expressions. Divide polynomials. Solve rational equations. (11-1, 11-2, 11-3, 11-4, 11-5, 11-6, 11-7)

Materials and Resources
Textbook
Online Resources

Academic Vocabulary
Radical Functions and Geometry
conjugate
converse
cosine
Distance Formula
extraneous solution
hypotenuse
inverse cosine
inverse sine
inverse tangent
legs
midpoint
Pythaogorean triple
radical equation
radical expressions
radical functions
radicant
rationalizing the denominator
sine
solving the triangle
square root function
tangent
trigonometric ratio
trigonometry
Rational Functions and Equations
asymptote
complex fraction
excluded value
extraneous solution
inverse variation
LCD
LCM
mixed expression
product rule
rate problems
rational equation
rational expression
rational function
work problems

Summative Assessment
Radical Functions and Geometry Assessment
Rational Functions and Equations Assessment

Topic: 10-1 Square Root Functions   **Duration:** 2 Day(s)

Topic Overview
Graph and analyze dilations of radical functions. Graph and analyze reflections and translations of radical functions.

Learning Targets
Graph and analyze dilations of radical functions. Graph and analyze reflections and translations of radical functions.

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Topic: 10-2 Simplifying Radical Expressions	**Duration:** 2 Day(s)

Topic Overview
Simplify radical expressions by using the Product Property of Square Roots. Simplify radical expressions by using the Quotient Property of Square Roots.

Learning Targets
Simplify radical expressions by using the Product Property of Square Roots. Simplify radical expressions by using the Quotient Property of Square Roots.

Topic: 10-3 Operations with Radical Expressions	**Duration:** 2 Day(s)

Topic Overview
Add and subtract radical expressions. Multiply radical expressions.

Learning Targets
Add and subtract radical expressions. Multiply radical expressions.

Topic: 10-4 Radical Equations	**Duration:** 2 Day(s)

Topic Overview
Solve radical equations. Solve radical equations with extraneous solutions.

Learning Targets
Solve radical equations. Solve radical equations with extraneous solutions.

Topic: 10-5 Pythagorean Theorem	**Duration:** 2 Day(s)

Topic Overview
Solve problems by using the Pythagorean Theorem. Determine whether a traingle is a right triangle.

Learning Targets
Solve problems by using the Pythagorean Theorem. Determine whether a triangle is a right triangle.

Topic: 10-6 Trig Ratios	**Duration:** 2 Day(s)

Topic Overview
Find trig ratios of angles. Use trig to solve triangles.

Learning Targets
Find trig ratios of angles. Use trig to solve triangles.

Topic: 11-1 Inverse Variation	**Duration:** 2 Day(s)

Topic Overview
Identify and use inverse variations. Graph inverse variations.

Learning Targets
Identify and use inverse variations. Graph inverse variations.

Topic: 11-2 Rational Functions	**Duration:** 2 Day(s)

Topic Overview
Identify excluded values. Identify and use asymptotes to graph rational functions.

Learning Targets
Identify excluded values. Identify and use asymptotes to graph rational functions.

Algebra I

Mathematics

Topic: 11-3 Simplifying Rational Expressions	**Duration:** 2 Day(s)

Topic Overview
Identify values excluded from the domian of a rational expression. Simplify rational expressions.

Learning Targets
Identify values excluded from the domian of a rational expression. Simplify rational expressions.

Topic: 11-4 Multiplying and Dividing Rational Expressions	**Duration:** 2 Day(s)

Topic Overview
Multiply rational expressions. Divide rational expressions.

Learning Targets
Multiply rational expressions. Divide rational expressions.

Topic: 11-5 Dividing Polynomials	**Duration:** 2 Day(s)

Topic Overview
Divide a polynomials by a monomial. Divide a polynomial by a binomial.

Learning Targets
Divide a polynomials by a monomial. Divide a polynomial by a binomial.

Topic: 11-6 Adding and Subtracting Rational Expressions	**Duration:** 2 Day(s)

Topic Overview
Add and subtract rational expressions with like denominators. Add and subtract rational exponents with unlike denominators.

Learning Targets
Add and subtract rational expressions with like denominators. Add and subtract rational exponents with unlike denominators.

Topic: 11-7 Mixed Expressions and Complex Fractions	**Duration:** 2 Day(s)

Topic Overview
Simplify mixed expressions. Simplify complex fractions.

Learning Targets
Simplify mixed expressions. Simplify complex fractions.

Unit: Data Analysis

Duration: 3 Week(s)

Algebra I

Mathematics

Grade(s) 9th - 12th, Duration 1 Year, 1 Credit
Required Course

Unit Overview
Statistics and Probability: Design surveys and evaluate results. Use permutations and combinations. Find probabilities of compound events.
Design and use simulations. (12-1, 12-2, 12-3, 12-4, 12-5, 12-6, 12-7, 12-8)

Materials and Resources
Textbook
Online resources

Academic Vocabulary
Statistics and Probability
bias combination
compound event
convenience sample
dependent events
discrete random variable
distribution
expected value
experiment
experimental probability
independent events
linear transformation
mean absolute deviation (MAD)
mutually exclusive events
observational study
parameter
permutation
population
probability distribution
probability graph
random variable
sample
self-selected smaple
simple random sample
simulation
standard deviation
statistic
statistical inference
survey
systematic sample
theorectical probability
variance

Summative Assessment
- Statistics and Probability Assessment

Topic: 12-1 Samples and Studies

Duration: 1 Day(s)

Topic Overview
Classify and analyze samples. Classify and analyze studies.

Learning Targets
Classify and analyze samples. Classify and analyze studies.

Topic: 12-2 Statistics and Parameters

Duration: 1 Day(s)

Topic Overview
Identify sample statistics and population parameters. Analyze data sets using stats.

Learning Targets
Identify sample statistics and population parameters. Analyze data sets using stats.

Topic: 12-3 Distributions of Data

Duration: 2 Day(s)

Topic Overview
Describe the shape of a distribution. Use the shapes of a distributions to select appropriate stats.

Learning Targets
Describe the shape of a distribution. Use the shapes of a distributions to select appropriate stats.

Topic: 12-4 Comparing Sets of Data	**Duration:** 2 Day(s)

Topic Overview
Determine the effect that transformations of data have on measures of central tendency and variation. Compare data using measures of central tendency and variation.

Learning Targets
Determine the effect that transformations of data have on measures of central tendency and variation. Compare data using measures of central tendency and variation.

Topic: 12-5 Simulations	**Duration:** 2 Day(s)

Topic Overview
Calculate experimental probabilieites. Design simulations and summarze data from simulations.

Learning Targets
Calculate experimental probabilieites. Design simulations and summarze data from simulations.

Topic: 12-6 Permutations and Combinations	**Duration:** 2 Day(s)

Topic Overview
Use permutations. Use combinations.

Learning Targets
Use permutations. Use combinations.

Topic: 12-7 Probability of Compound Events	**Duration:** 2 Day(s)

Topic Overview
Find probabilities of independent and dependent events. Find probabilities of mutally exclusive events.

Learning Targets
Find probabilities of independent and dependent events. Find probabilities of mutally exclusive events.

Topic: 12-8 Probability Distributions	**Duration:** 2 Day(s)

Topic Overview
Find probabilities by using random variables. Find the expected value of a probability variation.

Learning Targets
Find probabilities by using random variables. Find the expected value of a probability variation.