

Grade 9 Curriculum

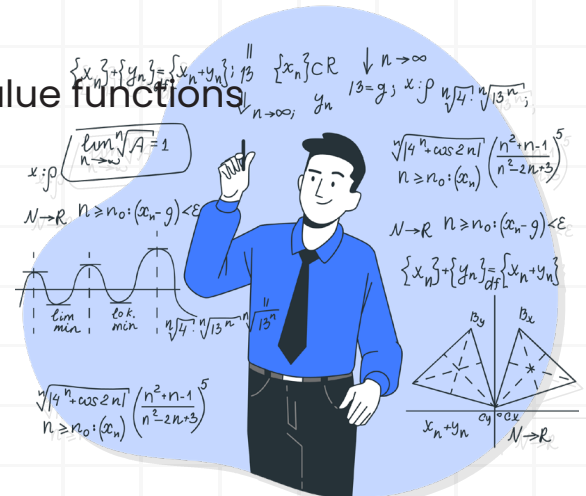
Functions (Advanced)

- Relative maximums and minimums
- Absolute maxima and minima
- Identifying intervals: positive and negative
- Increasing and decreasing intervals
- Graph interpretation word problems
- Finding average rate of change
- Finding average rate of change word problems
- Evaluate inverse functions
- Finding inverses of linear functions
- Functions with Transformations



Absolute Value Piecewise and Inverse Functions

- Evaluating piecewise functions
- Evaluating step functions
- Analyzing piecewise functions graphs
- Identifying domain and range for absolute value functions
- Shifting absolute value graphs
- Transforming absolute value functions
- Evaluate inverse functions
- Solving for linear inverses



Properties of Exponents

- Exponents with integer, decimal, and fractional bases
- Power Rules: Multiplication and Division
- Simplify powers of products and quotients
- Rules of exponents (hard) (integer exponents)
- Simplifying exponential expressions
- Evaluating expressions using exponent rules
- Recognizing equivalent exponential expressions

Rational Exponents and Radicals

- Evaluating rational exponents (integers)
- Finding cube roots
- Square roots of rational numbers
- Rewriting square roots
- Square roots with variables
- Simplify Radical Expressions
- Simplifying expressions with rational exponents



Introduction to Exponential Functions

- Determining exponential vs linear growth
- Exponential vs. linear models
- Evaluating exponential functions
- Writing exponential functions from their graphs
- Domain and range of exponential functions
- Exponential expressions word problems (numerical)
- Exponential expressions word problems (algebraic)
- Interpreting exponential expressions (word problems)
- Identifying exponential growth vs decay
- Creating functions with exponential decay
- Writing exponential growth expressions (word problems)



Sequences

- Arithmetic and geometric sequences
- Arithmetic sequences (fill in missing number and extend)
- Use arithmetic sequence formulas
- Recursively defining arithmetic sequences
- Finding the nth term (arithmetic sequences)
- Converting between recursive & explicit (arithmetic sequences)
- Geometric sequences (fill in missing number and extend)
- Extend geometric sequences: negatives & fractions
- Use geometric sequence formulas
- Recursively defining geometric sequences
- Finding the nth term (geometric sequences)
- Converting between recursive and explicit (geometric sequences)
- Identify type of sequence (explicit or recursive)
- Sequences word problems
- Evaluate sequences in recursive form
- Sequences and domain



Systems of Equations

- Systems of equations with graphing
- Solutions of systems of equations
- Systems of equations with substitution
- Number of solutions to a system of equations graphically
- Number of solutions to a system of equations algebraically
- Systems of equations word problems
- Modeling Multi-step Equations with Algebra Tiles

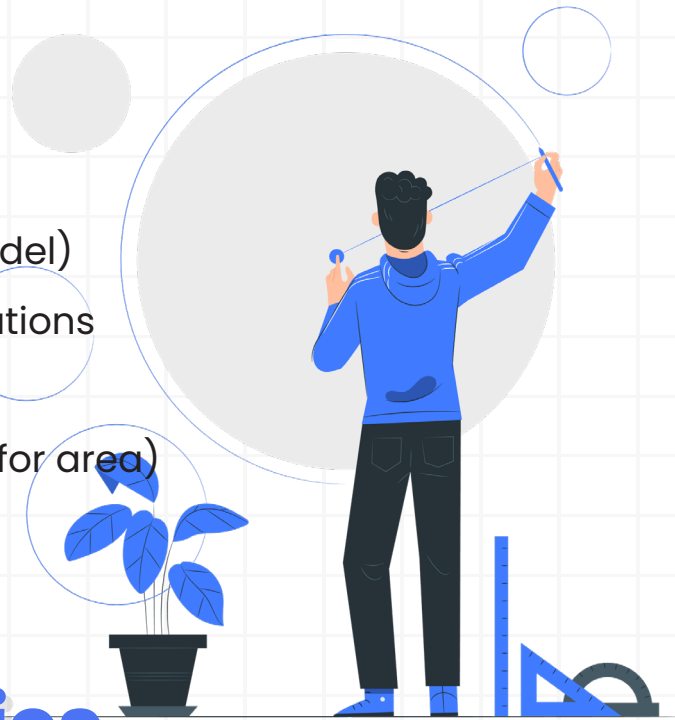
Geometry

- Distance between two points
- Use Pythagorean theorem to find perimeter
- Use Pythagorean theorem to find area
- Pythagorean Theorem word problems
- Use Pythagorean theorem to find right triangle side lengths
- Use Pythagorean theorem to find isosceles triangle side lengths
- Right triangle side lengths
- Finding angle measures using triangles
- Find angles in isosceles triangles
- Find angles in triangles
- Angle relationships with parallel lines
- Volume of cylinders
- Volume of spheres
- Volume of cones
- Volume of cylinders, spheres, and cones word problems
- Find Missing Pieces using Volume of Cone
- Find Missing Pieces using Volume of Cylinder
- Find Missing Pieces using Volume of Spheres
- Mixed Practice Find Missing Pieces using Volume of Cone, Cylinder, Spheres



Working With Polynomials

- Adding and subtracting polynomials
- Multiplying polynomials by monomials
- Multiplying two binomials
- Multiply binomials special cases
- Multiplying polynomials (using area model)
- Multiply Polynomials: Geometric Applications
- Multiplying polynomials by binomials
- Multiplying polynomials (using formula for area)
- Polynomial division: monomials
- Polynomial division: long division



Factoring Quadratics and Other Polynomials

- Identifying the greatest common factor of monomials
- Factoring polynomials using greatest common factors
- Factoring polynomials by grouping
- Factoring polynomials completely
- Finding the difference of squares
- Factoring perfect squares
- Factoring with word problems

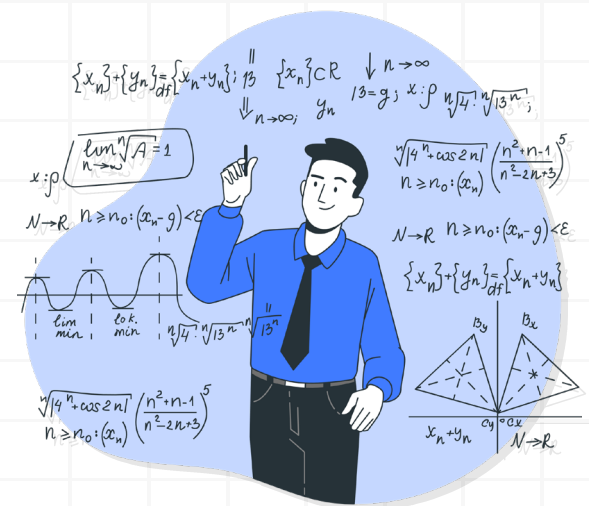


Quadratic Equations

- Solving quadratic equations by square roots
- Quadratics by taking square roots: strategy
- Zero product property
- Solving quadratic equations by factoring
- Solve equations using substitution
- Solving quadratic equations by quadratic formula
- Identifying solutions to quadratic equations
- Solving quadratic equations by completing the square
- Solve equations by completing the square

Quadratic Functions

- Analyzing parabolas
- Interpret parabolas in context
- Interpret a quadratic graph
- Graphing quadratics (factored form)
- Graphing quadratics (vertex form)
- Graphing quadratics (standard form)
- Features of quadratic functions: strategy
- Features of quadratic functions
- Graph parabolas in all forms
- Interpret quadratic models
- Compare quadratic functions
- Shifting parabolas
- Scaling and reflecting parabolas
- Quadratic word problems (factored form)
- Solving quadratic word problems (standard form)
- Quadratic word problems (vertex form)



Additional Topics in Algebra 1

- Unit conversions
- Rational and irrational numbers
- Rational and irrational expressions

