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|  **Checklist for Teaching Math 1** | **NOTES**  |
| **Unit 1** **Solving Equations**  |  |
| * solve one-step equations
* solve two-step equations
* solve multi-step equations(including combining like terms, variables on both sides, clearing fractions,etc.)
* solve one- and multi-step inequalities and graph the solution on a number line
* write and solve equations from real-world scenarios (including percentages, weighted averages/mixture problems, perimeter, angle relationships)
* transform formulas for a given variable
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| * simplify expressions
* identify constants and coefficients
* Understand and identify the different parts of an expression and their real-life meaning.
* use units correctly in solving a word problem
* convert units
* solve one-step inequalities
* solve two-step inequalities
* solve multi-step inequalities(including combining like terms, variables on both sides, clearing fractions,etc.)
* solve one- and multi-step inequalities and graph the solution on a number line
* use algebraic proofs to explain each step when solving equations and inequalitites
* solve an equation for a variable when the equation contains two or more variables
* transform formulas for a given variable
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| Unit 2 Graphing Equations and Inequalities |  |
| * define relations and functions
* define the domain and range
* explain that every point (x,y) on the graph of an equation represents values of x and y that make the equation true.
* determine where the function is increasing or decreasing
* determine if a graph, table, mapping, or equation is a function; explain function notation
* find the range (output values) of an linear function given the domain (input values
* analyze the meaning of the input and output values of a function based on a problem situation
* Identify sequences (tables, equations, and graphs) that are linear functions
* create a NEXT-NOW statement for a arithmetic sequence
* identify the common difference for an arithmetic sequence
* understand that an arithmetic sequence is a linear function
* identify the x and y intercepts of a linear function
* use the x and y intercepts to graph a line
* interpret the meaning of x and y intercepts as they pertain to a specific situation
* identify the domain intervals where the function is increasing or decreasing (range)
* determine appropriate domain and range values given a real-explain the connection between average rate of change and the slope formula
* calculate the average rate of change of a function, graph, or table
* interpret the meaning of average rate of change (using units) as it pertains to a real world problem
* life scenario
* transform a standard form linear equation into slope-intercept form
* graph a linear equation using the slope and y-intercept or x and y-intercepts
* interpret the meaning of the y-intercept and slope in terms of the units stated in the data
* compare linear functions given different forms (word problem, equation, table, and/or graph)
* write a linear function modeling a real-world scenario (given a graph)
* write a linear function representing an arithmetic sequence from a graph
* translate between the recursive and explicit forms of arithmetic sequences
* see the effect on a graph if a value is added to the original function, multiplied by the original function, etc.
* recognize the effect on the x and y intercepts of the parent function once translated
* use technology to see the effects on my graph.
* deter understand a graph of a curve (including a line) is formed by a set of solutions (or points) written as ordered pairs
* identify, given a list of points, solutions of a given equation
* substitute ordered pairs into a given equation to determine solutions
* mine practical and non-practical domain for a real-world problem
* graph a linear inequality with two variables on a coordinate plane
* define linear inequality, half-plane/regions, and boundary
* find viable solutions within a solution area of a linear inequality with two variables
* model real world linear inequality and understand the solution area
* use technology to represent a linear inequality with two-variables
* determine proper domain and range values for a real-world scenario
* determine viable and non-viable solutions to real-world problems
* determine the rate of change as the slope and the constant as the y-intercept in terms of a real-life scenario
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| **Unit 3****Writing Equations of Lines** |  |
| * create linear equations dealing with real-world problems and graph on a coordinate plane
* use technology to represent a linear equation with two-variables
* determine proper domain and range values for a real-world scenario
* determine viable and non-viable solutions to real-world problems
* construct a linear function (equation) and understand its connection to an arithmetic sequence
* write a linear equation given a graph, a description of a relationship, or table
* use technology to write the equation of a line given two points
* write an equation of a line in various forms (Standard Form, Slope-Intercept Form, Point-Slope Form)
* construct a linear function (equation) and understand its connection to an arithmetic sequence
* write a linear equation given a graph, a description of a relationship, or table
* use technology to write the equation of a line given two points
* write an equation of a line in various forms (Standard Form, Slope-Intercept Form, Point-Slope Form)
* determine practical and non-practical domain for a real-world problem
* write a function relating the relationship between two variables
* create a function to represent an arithmetic sequence
* determine the effect on a function if a constant is added to or subtracted from the original function
* Convert a recursive form to an explicit form.
* translate between the recursive(NEXT-NOW) and explicit forms of arithmetic sequences
* write a function to represent an arithmetic sequence
* use an arithmetic function to model a real-world scenario
* see the effect on a graph if a value is added to the parent function, multiplied by the parent function, etc.
* recognize the effect on the x and y intercepts of the parent function once translated
* use technology to see the effects of the graph
* write the equation of a line that is parallel or perpendicular to another equation and passes through a given point
* prove that two equations are parallel (same slope, but different y-intercepts)
* prove that two equations are perpendicular (opposite and reciprocal slopes, same or different y-intercepts)
* make a scatter plot
* determine if a set of data represents a linear model
* determine if the linear model is increasing or decreasing
* identify the independent variable and dependent variable and describe the relationship of the variables
* state the correlation (association) of the data
* sketch the function of best fit on the scatter plot
* write the equation using two points of the line of best fit
* use technology to find the regression equation for best fit line for a scatter plot
* use a function of best fit to make predictions
* identify how well the data fits the linear equation (correlation coefficient)
* identify residuals
* determine the rate of change as the slope and the constant as the y-intercept in terms of the line of best fit of a set of data
* use a calculator to find the correlation coefficient and determine its meaning in terms of the data
* understand that correlation does not always imply causation
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| Unit 4Systems of Equation/Inequalities |  |
| * define systems of linear equations
* identify the solution of a system of equations as the intersection point
* explain why some systems of linear equations have no solution or infinitely many solutions
* identify systems of linear equations that have no solution or infinitely many solutions
* determine the approximate solution to a system of linear equations by graphing both equations and estimating the point of intersection
* identify systems of linear equations that have no solution or infinitely many solutiowrite the system of equations and/or inequalities that best model the problem
* interpret the solutions in the context of the solution modeled and decide if they are reasonable
* solve maximum profit problems
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* solve systems of linear equations by substitution and elimination
* recognize that the solution to an equation with variables on both sides is the same as the x-value of the intersection point of a system of equations
* explain that the solution set for a system of linear inequalities is the intersection of the shaded regions (half plane) of both inequalities
* explain why some systems of linear equations have no solution or infinitely many solutions
* identify systems of linear equations that have no solution or infinitely many solutions
* solve a system of linear equations by substitution to fine the exact solution
* solve a system of linear equations by elimination to find the exact solution
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| Unit 5Exponents ( monimials) |  |
| * apply properties of exponents to simplify algebraic expressions (monomials) with integer exponents
* apply properties of exponents to simplify algebraic expressions (monomials) with rational (fractional) exponents
* write expressions with rational exponents as radical expressions
* write radical expressions as expressions with rational exponent
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| **Unit 6****Polynomials** |  |
| * identify polynomials
* add and subtract polynomials
* apply adding and subtracting polynomials to perimeter problems
* multiply polynomials
* apply multiplying polynomials to area problems
* apply models for multiplying polynomials to rewrite expressions
* apply the converse of the distributive property (factor using a GCF)
* group the parts of an expression differently in order to better interpret their meaning (factor by grouping)
* factor a trinomial with a leading coefficient of 1
* factor a trinomoial with a leading coefficient greater than 1
* apply models for factoring and multiplying binomials to rewrite expressions
* apply models for factoring and multiplying trinomials to rewrite expressions
* identify special products (perfect square trinomials or difference of perfect squares); square of a sum, square of a difference, product of a sum and a difference
* factor using the difference of perfect squares
* recognize an equation as quadratic
* use the Zero Product Property to solve an equation
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| **Unit 7** **Radicals and Geometry** |  |
| * simplify radicals (including rationalizing the denominator)
* operate with radicals (add, subtract, multiply and divide)
* use Pythagorean Theorem to show the exact (simplified radical) solution to a missing side length
* find the distance between two points using the distance formula
* find the distance between two points using Pythagorean Theorem
* use the distance formula to prove two points lie on a circle given the radius
* use my knowledge of parallel lines, perpendicular lines, and the distance formula to classify a quadrilateral
* prove two lines are parallel or perpendicular based on the slope
* find the midpoint of a line segment
* find missing coordinates of a line segment using the midpoint or distance formula
* use the distance and midpoint formulas to determine the length of any segment on a line
* use the midpoint and distance formulas to calculate the area or perimeter of a polygon (triangles/rectangles)
* use the Pythagorean Theorem to calculate the area or perimeter of a polygon (triangles/rectangles)
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| Unit 8Quadratics |  |
| * graph a quadratic function using a table of values
* graph a quadratic function using the vertex, axis of symmetry, and the y-intercept
* find the range (output values) of a quadratic function given the domain (input values)
* analyze the meaning of the input and output of a function based on a problem situation
* identify the x and y intercepts of a quadratic function
* interpret the meaning of x (roots) and y intercepts (constant term) as they pertain to a specific situation
* identify (domain) intervals where the quadratic function (range) is increasing (positive) or decreasing (negative)
* determine the relative maximum or minimum of a quadratic function
* identify the symmetry within the quadratic function
* identify the characteristics of the function and the effect on the graph
* determine is the parabola opens up or down
* determine if the parabola is wide or narrow
* determine appropriate domain and range values given a real-life scenario and identify any restrictions that exist
* sketch a graph of a simple quadratic function using the vertex, axis of symmetry, and the y-intercept
* sketch a graph of a quadratic function using a graphing calculator (or other technology)
* identify the intercepts, maximum/minimum of quadratic functions
* solve a quadratic equation by factoring
* identify that the zeros are the solutions (x-intercepts, roots, solutions) of the quadratic equation
* estimate the zeros (x-intercepts, roots, solutions) between two integral roots
* determine the number of solutions (zeros, roots, x-intercepts) using the discriminant
* compare the characteristics of two or more quadratic functions (vertex: max/min, y-intercepts, roots, etc.) given different forms (word problem, equation, table, and/or graph)
* write a function relating the relationship between two variables
* add or subtract quadratic functions to model real-world examples
* determine the effect on a function if a constant is added or subtracted from the original function
* identify the terms, factors, and coefficients of a quadratic equation
* recognize an expression in its expanded form can be simplified to a quadratic function
* recognize real world problems that require the structure of a quadratic expression (i.e. area problems that have dimensions as polynomials)
* factor a quadratic equation to reveal the zeros (x-intercepts, solutions, roots)
* understand a graph of a curve (including a line) is formed by a set of solutions (or points) written as ordered pairs
* identify, given a list of points, solutions of a given equation
* substitute ordered pairs into a given equation to determine solutions
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| Unit 9Exponential Functions |  |
| * find the range (output values) of an exponential function given the domain (input values)
* analyze the meaning of the input and output values of a function based on a problem situation
* identify sequences (tables, equations, and graphs) that are exponential functions
* create a NEXT-NOW statement for a geometric sequence
* identify the common ratio for a geometric sequence
* understand that a geometric sequence can be an exponential function
* identify the y intercept of an exponential function
* interpret the meaning of the y intercept as it pertains to a specific situation
* identify (domain) intervals where the exponential function (range) is increasing (positive) or decreasing (negative)
* understand that the graph of the exponential function approaches the constant
* determine appropriate domain and range values given a real-life scenario and identify any restrictions that exist
* understand that the graph of the exponential function approaches the constant
* use technology to find where the two functions intersect
* graph an exponential function using a table of values
* create an exponential function based on a real world scenario
* explain the parts of an exponential function
* interpret an exponential function by viewing the individual parts
* recognize the percent of growth or decay per unit interval
* recognize real world problems that require the structure of an exponential expression (i.e. growth/decay)
* write a function relating the relationship between two variables
* determine the effect on a function if a constant is added to or subtracted from the original function
* add or subtract exponential functions to model a real world scenarios
* ctranslate between a recursive (NEXT-NOW) and an explicit forms of a geometric sequence
* write a geometric sequence to model a real world scenario
* write a function to represent a geometric sequence
* onvert a recursive rule into explicit form
* see the effect on a graph if a value is added to the parent function, or multiplied by the parent function
* recognize the effect on the y-intercept of the parent function once translated
* utilize technology to determine the effect on a exponential function when a value is added to or multiplied to the original function
* recognize linear functions have a common difference and exponential functions have a common ratio
* decide whether a situation can be represented using a linear or exponential model
* write an exponential function to model a real world scenario
* understand that in the exponential growth formula y=a(1+r)x, r represents the constant percent rate per unti interval
* understand that in the exponential decay formula y=a(1-r)x, r represents the constant percent rate per unti interval
* construct an exponential function and understand its connection to a geometric sequence
* construct an exponential function given a table, a graph, a word problem, or two ordered pairs
* use technology to write an equation in exponential form
* observe two different types of functions and determine which function increases most rapidly
* determine a reasonable domain for an exponential function
* make a scatter plot
* determine if a set of data represents an exponential model
* determine if the exponential model is increasing or decreasing
* identify the independent variable and dependent variable and describe the relationship of the variables
* sketch the function of best fit on the scatter plot
* write the regression equation
* use technology to find the function of best fit for a scatter plot
* use a function of best fit to make predictions

**Unit 10****Geometry** |  |
| * define geometry terms
* explain the formulas for the circumference and area of a circle
* create an informal argument for the formulas of a cylinder, cone and how it derives from the area of a circle
* create an informal argument for the formulas of a cone and pyramid and how it is related to the formulas for a cylinder and prism
* understand that the tool used in measuring determines the level of accuracy that can be reported for a measurement
* understand that the tool used in measuring determines the level of accuracy that can be reported for a measurement
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| **UNIT 11****STATISTICS** |  |
| * display and describe single variable data
* choose and interpret the scale in dot plots, histograms, and box plots
* understand what quantities are reasonable to describe a data set
* represent or display data using dot plots, histograms, and box plots.
* determine and justify which measure of center is most appropriate to describe a given data set
* explain why the distribution of data takes on a particular shape
* explain the effect of any outlier on the shape, center, and spread of the data sets
* understand that the higher the value of a measure of variability, the more spread out the data set is
* determine if data is skewed
* use technology to interpret data
* create a two-way frequency table from a set of data on two categorical variables
* calculate and interpret joint, marginal, and conditional relative frequencies
* describe associations and trends in the data
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