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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 |  |
| * 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 |  |
| **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 |  |
| Unit 4  Systems 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 * ns * 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 |  |
| Unit 5  Exponents ( 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 |  |
| **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 |  |
| **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) |  |
| Unit 8  Quadratics |  |
| * 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 |  |
| Unit 9  Exponential 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 |  |
| **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 |  |