

Secondary Math 1

Priority Standards #1 Solve Algebraic Equations (linear and exponential)	
0	<i>No Evidence</i>
1	<ul style="list-style-type: none"> Given an expression, identify the terms, base, exponents, coefficients, and factors. Determine if a solution to a one-variable equation is true. Evaluate exponential expressions For example, 2^x when $x=3$.
2	<ul style="list-style-type: none"> Identify slope and y-intercept in a linear function. Solve a system of linear equations graphically. Solve one-variable equations. Solve one-variable inequalities. Use properties of and laws of exponents to simplify expressions. Use the properties of compound inequalities to solve. Solve a simple exponential equation with same base. Convert slope intercept to standard.
3	<ul style="list-style-type: none"> Identify y-intercept and growth factor/growth rate in an exponential function. Solve a system of linear equations using substitution and elimination. Determine the real-world context of the variables in an expression. Solve literal equations to highlight a variable of interest. Explain and apply the properties of compound inequalities. Solve compound inequalities in one variable. Solve a simple exponential equation by finding common base. Use structure to predict one, infinitely many or no solutions.
4	<ul style="list-style-type: none"> Interpret the solution to any exponential equation. Determine the best method to solve a system of equations

Priority Standards #2 Understand, Compare, and Represent Functions (linear and exponential)	
0	<i>No Evidence</i>
1	<ul style="list-style-type: none"> Interpret and recognize linear functions. Interpret the slope of a function. Interpret the y-intercept of a function.
2	<ul style="list-style-type: none"> Represent functions using Function notation. Calculate the average rate of change of a function (linear or exponential). Represent and solve equations graphically. Interpret and recognize exponential functions via graph and equation. Construct a linear function given a situation, a set of ordered pairs, or a table. Compare and contrast two linear functions.
3	<ul style="list-style-type: none"> Interpret average rate of change of a function. Interpret and compare different representations of functions.



	<ul style="list-style-type: none"> • Represent and solve inequalities graphically. • Interpret and recognize exponential functions in various forms. • Distinguish between situations that can be modeled with linear functions and with exponential functions. • Complete function transformations ($f(x)$ to $f(x)+k$, where k is any real number). • Explain the connection between linear functions and arithmetic sequences. • Explain the connection between exponential functions and geometric sequences. • Construct an exponential function given a situation, ordered pairs, or a table. • Construct an arithmetic sequence given a situation, ordered pairs, or a table. • Construct a geometric sequence given a situation, ordered pairs, or a table. • Make connections between geometric sequences and exponential functions and arithmetic sequences and linear functions. • Compare and Contrast two or more exponential functions. • Observe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly using graphs and tables.
4	<ul style="list-style-type: none"> • Predict future behavior when comparing linear and exponential functions. • Compare and contrast exponential functions with linear functions.

Priority Standards #3
Describe Characteristics of Functions (linear and exponential)

0	<i>No Evidence</i>
1	<ul style="list-style-type: none"> • Rewrite linear equations using function notation. • Evaluate functions given $y=f(x)$, calculate values given either an x or y value. • Identify whether a function is linear or exponential given an equation.
2	<ul style="list-style-type: none"> • Understand the definition of a function (mapping elements from domain to range, inputs and outputs) and recognize that each element of the domain assigns to exactly one element of the range. • Determine if a relation is a function given a table or a graph. • Understand that arithmetic and geometric sequences are functions and the domain of which is a subset of integers. • Express a recursive sequence as a function.
3	<ul style="list-style-type: none"> • Understand the graph of f is the graph of the equation $y=f(x)$. • Identify elements of the domain and range using various representations of a function (graph, table, equation, context, geometric model). • Evaluate functions created using arithmetic operations (example: $f(x)+g(x)$ or $f(x)-g(x)$) • Given a graph or table of values, identify key features including x- and y-intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior. • Use interval notation and inequality notation to communicate key features of graphs. • Understand and show linear functions grow by equal differences over equal intervals; exponential functions grow by equal factors over equal intervals.



	<ul style="list-style-type: none"> Interpret slope and y-intercept of a linear function. Interpret the base value and vertical shifts of an exponential function.
4	<ul style="list-style-type: none"> Explain how a given representation of a function (graph, table, equation, context, geometric model) can be used to identify elements of the domain and corresponding elements of the range (x, $f(x)$). Interpret statements that use function notation in terms of a context (example: given a context, explain $f(5) = 12$) Describe in context the meaning of the domain and range and identify appropriate values for the domain and range in context. Explain whether a function is linear or exponential given a context.

Priority Standards #4 Represent and Analyze Relationships	
0	<i>No Evidence</i>
1	<ul style="list-style-type: none"> Create polygons on a grid by graphing vertices. Understand the definition of parallel and perpendicular lines. Recognize parallel and perpendicular lines given a graph.
2	<ul style="list-style-type: none"> Compare and contrast rigid and non-rigid transformations. Use rigid and non-rigid transformations for shapes on a grid. Represent rigid transformations using a variety of media. Create a polygon and perform transformations given rules. Identify the minimum conditions necessary for triangle congruence. Define symmetry. Recognize parallel or perpendicular lines given equations for two lines.
3	<ul style="list-style-type: none"> Predict the effect of a rigid transformation. Justify congruence using properties of rigid motions. Identify a sequence of transformations that will carry a given figure to another. Identify corresponding parts of two triangles. Show triangle congruence using CPCTC. Understand, explain, and demonstrate why ASA, SAS, and SSS are sufficient to prove congruence. Understand, explain, and demonstrate why AAA and SSA are not sufficient to prove congruence. Compare and contrast ASA and AAS congruence theorems. Use coordinates to prove simple geometric theorems algebraically. Apply the Distance formula to find the distance between two points to find perimeters of polygons and areas of rectangles and triangles. Identify lines of symmetry and points of rotation. Prove slopes of parallel lines are equal.



	<ul style="list-style-type: none"> • Prove the product of perpendicular slopes is -1. • Use slope criteria for parallel and perpendicular lines to solve geometric problems (prove congruence) • Write line equations for parallel and perpendicular lines passing through given points.
4	<ul style="list-style-type: none"> • Describe transformations of objects not on a grid. • Predict the effect of multiple rigid transformations.

Priority Standards Mathematical Modeling	
0	<i>No Evidence</i>
1	
2	<ul style="list-style-type: none"> • Given a function (linear or exponential), use various representations to display features of the function. • Recognize patterns in expressions, equations, tables, and graphs. • Write formulas for sequences. • Given a linear or exponential function, sketch a graph of the function. • Given the graph of a linear or exponential function, write the equation of the function.
3	<ul style="list-style-type: none"> • Given a formula or expression, explain the meaning and use of the different operations, constants, and variables. • Estimate the rate of change from a graph. • Interpret slope and y-intercept of a linear function. • Interpret the base value and vertical shifts of an exponential function. • Apply geometric concepts in modeling situations.
4	<ul style="list-style-type: none"> • Explain and interpret key features of functions in context (common differences, common ratios, increasing, decreasing, maximum values, minimum values). • Describe in context the meaning of the domain and range and identify appropriate values for the domain and range in context. • Describe the meaning of the rate of a function in context. • Discuss end behavior of a function. • Model contextual situations with arithmetic or geometric sequences.

Standards pulled from:

- **Priority #1**
 - **A.SSE.1**
 - Given an expression, identify the terms, base, exponents, coefficients, and factors.



- Determine the real-world context of the variables in an expression.
 - Explain the context of different parts of a formula.
 - **A.REI.3**
 - Solve one-variable equations and literal equations to highlight a variable of interest.
 - Understand and apply the properties of compound inequalities.
 - Solve compound inequalities in one variable.
 - Solve simple exponential equations that rely only on application of the laws of exponents (limit solving exponential equations to those that can be solved without logarithms).
 - Solve absolute value inequalities.
 - **A. REI. 5**
 - Explain the use of the multiplication property of equality to solve a system of equations.
 - Explain why the sum of two equations is justifiable in the solving of a system of equations. (Property of equality)
 - Relate the process of linear combinations with the process of substitution for solving a system of linear equations.
 - **A.REI.6**
 - Solve a system of linear equations using various representations (numerically, algebraically, and graphically).
 - Use structure to predict one, infinitely many or no solutions.
- **Priority #2**
 - F.BF.1
 - Recognize patterns in a table, geometric model, or other representation to determine an explicit expression and a recursive process.
 - Combine constant, linear, and/or exponential functions using addition or subtraction
 - F. BF. 2
 - Write recursive and explicit formulas to represent arithmetic sequences.
 - Write recursive and explicit formulas to represent geometric sequences.
 - Connect arithmetic sequences to linear functions and geometric sequences to exponential functions.
 - Translate between recursive and explicit formulas for sequences.
 - Model contextual situations with arithmetic or geometric sequences.
 - F. BF. 3
 - Describe verbally and graphically what will happen to linear and exponential functions when $f(x)$ is replaced by $f(x) + k$, where k is any real number.
 - Given a graph of $f(x)$ and $f(x) + k$ on the same coordinate axis, find the value of k .
 - Relate the vertical translation of a linear function to its y-intercept.
 - F.LE.2
 - Construct a linear function and/or an arithmetic sequence given a situation, a set of ordered pairs, or a table.
 - Construct an exponential function and/or a geometric sequence given a situation, ordered pairs, or a table
 - F.IF.6
 - Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Focus on linear and exponential functions.
 - Estimate the rate of change from a graph.
 - S.ID.7
 - Interpret the slope in context of the situation.
 - Interpret the y-intercept in context of the situation
- **Priority #3**

- **Priority #4**

- F.IF.1
 - Understand the definition of a function in terms of mapping elements from one set (domain) to another set (range).
 - Explain how a given representation of a function (graph, table, equation, context, geometric model) can be used to identify elements of the domain and corresponding elements of the range (x , $f(x)$).
 - Understand the graph of f is the graph of the equation $y=f(x)$
- F.IF.2
 - Use function notation
 - Evaluate functions, including functions created using arithmetic operations (example: $f(x) + g(x)$ or $f(x) - g(x)$).
 - Interpret statements that use function notation in terms of a context (example: given a context, explain $f(5) = 12$)
- F.IF.3
 - Recognize that sequences are functions (recognize the domain is the number of the term and the range is the value of the term).
 - Define and express a recursive sequence as a function.
 - Recognize that a sequence has a domain which is a subset of integers
- IF.4
 - Given a graph, identify key features including x - and y -intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior.
 - Given a table of values, identify key features such as x - and y -intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior.
 - Use key features to sketch a graph of the function.
 - Use interval notation and symbols of inequality to communicate key features of graphs.
- IF.5
 - Identify domain of a function from any representation.
 - Relate the domain to context, explaining restrictions as a result of the context.
- F.LE.3
 - Observe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly using graphs and tables.
- F.LE.5
 - Interpret the parameters in a linear function in terms of a context. Parameters include slope and y - intercept
 - Interpret the parameters in an exponential function in terms of a context. Parameters include the base value and vertical shifts.
- S.ID.6
 - Represent data on two quantitative variables on a scatter plot and describe how variables are associated.
 - Given a set of bivariate data, plot and use residuals to assess the appropriateness of a given model to determine if the data has a linear relationship.
 - Find the line of best fit using technology.
 - Understand what a residual represents.

- **Priority #5**