Algebra I
Data & Statistics

Competencies

HS 1.1 HS 2.1 HS 2.2 HS 5.1

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

S.ID.1: Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
S.ID.2: Interpret differences in shape, center, and spread in the context of the data sets using dot plots, histograms, and box plots, accounting for possible effects of extreme data points (outliers)
S.ID.4: Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data. Recognize possible associations and trends in the data.

I can

I can calculate and compare the mean, mode, median, and range.
I can identify different data set representations.
I can construct and interpret a dot plot, box and whisker plot, frequency tables, and histogram.
I can describe the shape using mean or median.
I can describe the spread using range or Interquartile range.
I can explain the possible effects of an outlier
I can compare 2 sets of data using shape, spread or center.

Vocab

Content: Mode, Mean, Median, Range, Outlier, IQR - InterQuartile Range, Dot plot, Box and Whisker, Histogram, Quartile, Symmetric, Skew
Academic: Represent, Calculate, Summarize, Interpret, Compare/Contrast

Algebra I
Quantities & Modeling

Competencies

HS 1.1 HS 2.1 HS 2.2

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

N.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

A.REI.1: Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.REI.2: Apply and extend previous understanding to solve equations, inequalities, and compound inequalities in one variable, including literal equations and inequalities.
A.REI.3: Solve equations in one variable and give examples showing how extraneous solutions may arise.
A.REI.3a Solve rational, absolute value and square root equations.

Vocab

Content: inverse operations equation vs expression solution equivalent equations absolute value equation extraneous solution absolute value equation literal equations radical compound inequalities Intersection vs Union
Academic: Identify, Represent, Calculate, Graph, Summarize, Interpre,t Transform, Justify

Algebra I
Quantities & Modeling

I can

A.SSE.1
*I can define expression, factor, and coefficient.
*I can isolate or group terms of an expression to better interpret their meaning.
A.CED.1
*I can create an equation or inequality in one variable that can be used to solve a real- world problem.
A.CED.4
*I can identify the different variables in a formula.
*I can recongize a literal equation.
*I can transform formulas by isolating any given variable.
A.REI.1
*I can understand that solving an equation means that the equation remains balanced during each step.
*I can use order of operations and inverse operations to solve an equation/inequaltiy.
*I can explain the method for solving an equations and justify each step.
A.REI.2
*I can identify an error and defend a correct solution. (error anaylsis)
*I can solve compound inequalties in one or more variables and literal equations/inequalties.
*I can graph one variable multi-step inequalities and compound inequalitles on a number line.
*I can identify the extraneous solutions of a radical, rational, or absolute value equation.
*I can solve simple radical, rational or absolute value equations in one variable.

Algebra I Functions

Competencies

HS 1.1

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

N.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

F.IF.4. (all) For a function that models a relationship between two quantities, interpret key features of expressions, graphs and tables in terms of the quantities, and sketch graphs showing key features given a description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
F.IF.5. (all) Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
F.BF.1a: Use functions to model real-world relationships. Combine multiple functions to model complex relationships.
F.IF.1: Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range.
F.IF.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.3. Recognize patterns in order to write functions whose domain is a subset of the integers.

Vocab

Content: Domain, Range, Function, Dependent Variable, Independent Variable, Mapping, Diagram, Relation, Continuous Domain, Discrete Domain, Linear Function, Nonlinear Function, Function Notation f(x),
Academic: Identify, Represent, Calculate, Graph, Summarize, Interpret, Transfrom, Justify

Algebra I
Functions

N.Q.A. Reason quantitatively and use units to solve problems.

A.SSE.A. Interpret the structure of expressions.

A.CED.A. Create equations that describe numbers or relationships.

A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

F.IF.4. (all) For a function that models a relationship between two quantities, interpret key features of expressions, graphs and tables in terms of the quantities, and sketch graphs showing key features given
a description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.5. (all) Relate the domain of a function to its graph and, where applicable, to the quantitative relationship
it describes.

F.BF.1a: Use functions to model real-world relationships. Combine multiple functions to model complex relationships.

F.IF.1: Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range.

F.IF.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F.IF.3. Recognize patterns in order to write functions whose domain is a subset of the integers.

Algebra I
Linear Equations

Competencies

HS 2.1HS 1.1 HS 2.1 HS 2.2
HS 1.1 HS 2.1 HS 2.2

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

AN.Q.A. Reason quantitatively and use units to solve problems.

A.SSE.A. Interpret the structure of expressions.

A.CED.A. Create equations that describe numbers or relationships.

A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

A.CED.2 ★Apply and extend previous understanding to create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.REI.8. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

F.IF.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

F.IF.6. (9/10/11) Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. (9/10) limited to linear functions. ★

F.IF.7a. (9/10) Graph linear, quadratic and absolute value functions and show intercepts, maxima, minima and end behavior. ★

F.IF.8. Write a function in different but equivalent forms to reveal and explain different properties of the function.

F.IF.8a. (9/10) Use different forms of linear functions, such as slope-intercept, standard, and point-slope form to show rate of change and intercepts.

F.IF.9. Compare properties of two functions using a variety of representations (algebraically, graphically, numerically in tables, or by verbal descriptions).

Vocab

Content: Slope/Rate of change, Initial Value, Slope- Intercept form, Point - Slope form, Standard form, Intercepts (x & y), Solution, Region

Academic: Identify, Describe/Explain, Represent, Calculate, Solve, Graph, Construct/Create, Interpret, Transform Justify

Algebra I
Linear Equations

I can

IA.CED.2
*I can identify an equation or inequality in two variables that can be used to solve a real-world problem. (Linear)
*I can create an equation or inequality in two variables to model real world problems.
*I can solve and graph an equation or inequality in two variables. (Linear)

A.REI.8
*I can define a solution of an equation as the set of all points (x,y) on the graph of an equation that make the equation true.
*I can show that any point on a graph will result in a true statement when their coordinates are substituted into the equation.
*I can determine if a point is a solution to an equation or graph.

HS-F.IF.5
*I can identify and describe the domain of a function, give the graph or a verbal description of a function.
*I can identify and explain an appropriate domain based on the units in the problem and type of function it describes.
*I can identify and explain why all of the values in the domain occur and defend my reasoning.

HS-F.IF.6
*I can define interval, rate of change, and average rate of change.
*I can recognize slope as an average rate of change.
*I can calculate the average rate of change of a function over a specified interval.
*I can explain the connection between average rate of change and the slope formula
*I can interpret the average rate of change of a function over specified interval.

HS-F.IF.7a
*I can graph linear functions by hand in simple cases.
*I can graph linear functions using technology for more complicated cases.
*I can identify and graph a linear function in point-slope form, slope-intercept form, and standard form.
*I can determine the differences between simple and complicated linear functions and know when the use of technology is appropriate.
*I can relate the coefficients and constants to parts of the equation.

HS-F.IF.8a
*I can identify a linear function in point-slope form, slope-intercept form, and standard form
*I can show rate of change and intercepts of a linear function in point-slope form, slope-intercept form, and standard form.
*I can write different but equivalent forms of linear functions.

HS-F.IF.9
*I can identify types of functions based on verbal, numerical, algebraic, and graphical descriptions and state key properties such as intercepts, average rates of change, and end behaviors.
*I can use a variety of function representations (algebraically, graphically, numerically in tables, or by verbal descriptions) to compare and contrast properties of two functions.

Algebra I
Linear Systems

Standards

N.Q.A. Reason quantitatively and use units to solve problems.

A.SSE.A. Interpret the structure of expressions.

A.CED.A. Create equations that describe numbers or relationships.

A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

A.CED.3 ★ Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.

A.REI.6 Analyze and solve pairs of simultaneous linear equations.

a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x+2y=5$ and $3x+2y=6$ have no solution because $3x+2y$ cannot simultaneously be 5 and 6.

c. Solve real-world and mathematical problems leading to two linear equations in two variables.

A.REI.8 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A.REI.9 ★ Solve an equation $f\left(x\right)=g\left(x\right)$ by graphing $y=f\left(x\right)$ and $y=g\left(x\right)$ and finding the x-value of the intersection point. Include cases where $f\left(x\right)$ and/or $g\left(x\right)$ are linear, polynomial, rational, absolute value.

A.REI.10. Graph the solutions to a linear inequality in two variables as a half-plane(excluding the boundary in the case of a strict inequality, and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

F.BF.1a

1. Use functions to model real-world relationships.

a. (9/10) Combine multiple functions to model complex relationships.

Vocab

Content: System of equations, Inconsistent System, Consistent System, Independent Solution, Dependent Solution, Intersect, Point, System of Inequalities, Substitution method, Elimination method, Test Point, Solution Set

Academic: Identify, Describe/Explain, Represent, Calculate, Solve, Graph, Construct/Create, Interpret, Transform Justify

Algebra I
Linear Systems

A.CED.3
*I can determine when a problem should be represented by equations, inequalities, systems of equations, and/or inequalities and represent possible constraints.
*I can interpret solutions as viable or nonviable options in a modeling context.
*I can construct a system of equations or inequalities to describe a real-world problem.
A.REI. 6 a-c
*I can identify linear systems that have no solution or infinitely many solutions.
*I can explain why linear systems have no solution or infinitely many solutions.
*I can solve a system of linear equations using elimination, substitution, or estimating by graphing.
*I can design a mathematical model of two linear equations in two variables to make a decision and support mathematically a practical situation.
*I can design a mathematical model of two linear equations in two variables to make a decision and support mathematically a practical situation.
A.REI.8
I can explain that the solution set is an infinite that when graphed form a line/curve.
A.REI.9
*I can define a solution to a system of equations as a point of intersection on the graph.
*I can graph equations on a graphing calculator.
*I can use function notation to represent linear, quadratic and absolute value equations.
*I can reason that since y = f(x) and y = g(x), then f(x) = g(x) by the substitution property.
*I can find the approximate solution by where they intersect on the graph.
*I can solve f(x)=g(x) by graphing y = f(x) and y = g(x),and finding the x-value of the intersection point.
A.REI.10
*I can identify characteristics of a linear inequality and system of linear inequalities such as boundary line, shading and determining an appropriate point to test.
*I can explain the meaning of the intersection of the shaded regions in a system of linear inequalities.
*I can graph the solution set for a system of linear inequalities on a coordinate plane.
*I can check points in the intersection of half-planes to verify solutions.
F.BF.1a
*I can determine which arithmetic operation should be performed to build the appropriate combined function.
*I can combine two functions to model a real-world relationship.

Algebra I
Exponential Relationships

Competencies

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

N.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.
N.RN.1. Know and apply the properties of integer exponents to generate equivalent numerical and algebraic expressions.

I can

I N.RN.1.
I can state the properties of integer exponents.
I can apply the properties of integer exponents to simplify numerical expressions.
I can simplify and generate equivalent algebraic expressions.

Vocab

Content: Product, Rule, Quotient, Rule, Power of a Power Rule, Negative exponent Rule, Zero exponent Rule,
Academic: Identify, Apply, Transform

Algebra I
Polynomial Operations

Competencies

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

N.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.
A.APR.1 Add, subtract, and multiply polynomials.

I can

A.APR.1
I can identify a polynomial.
I can add, subtract and multiply polynomials.
I can simplify and generate equivalent algebraic expressions.

Vocab

Content: Monomial, Binomial, Trinomial, Polynomial, Degree of Polynomial, Constant, Linear, Quadratic, Cubic, nth degree, Standard Form Leading Coefficient
Academic: Combine, Simplify

Algebra I Factoring

Competencies

Standards

N.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

A.APR.4
Generate polynomial identities from a pattern.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
A.SSE.3★ Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
A.SSE.3a. Factor a quadratic expression to reveal the zeros of the function it defines.

Vocab

Content: leading coefficient,FOIL Method or Box Method, factored form, Zero-Product Property roots, repeated roots, greatest common factor (GCF), factoring by grouping, factored completely
Academic: Identify, Find

Algebra I
Factoring

I can

A.APR.4
I can verify polynomial identities.
I can factor polynomials by applying polynomial identities.

A.SSE.2
I can look for and identify clues in the structure of expressions (e.g., like terms, common factors, difference of squares, perfect squares) in order to rewrite in another way.
I can explain why equivalent expressions are equivalent.
I can apply models for factoring and multiplying polynomials to rewrite expressions.

A.SSE.3
I can recognize a quadratic function.
I can select a factoring strategy based on number of terms and common factors.
I can factor a quadratic expression ($ax^2 + bx + c$) to find the zeroes of the function it represents.
I can factor a difference of squares to find the zeroes of the function it represents.

Algebra I
Solving Quadratics Functions

Competencies

Resources

HMH, Quizizz, Desmos, EdPuzzle

Standards

N.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

A.REI.5a Solve quadratic equations and inequalities. Solve quadratic equations by inspection (e.g., for $x^2=49$), taking square roots, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives no real solutions.

A.APR.4 Generate polynomial identities from a pattern.
A.SSE.2 Use the structure of an expression to identify ways to rewrite it.

A.SSE.3★ Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
A.SSE.3a. Factor a quadratic expression to reveal the zeros of the function it defines.

F.BF.1: Use functions to model real-world relationships

Vocab

Content: counterexample, radical expression, simplest form, rationalizing the denominator, conjugates like radicals, radicand, perfect cube, quadratic equation, square root, discriminant
Academic: Solve, Simplify, Identify, Substitute, Formula

Algebra I
Solving Quadratics Functions

I can

A.REI.5a

I can explain the different types of solutions that arise when the discriminant of a quadratic expression is positive, negative, or zero.

I can explain the square root property.

I can make an argument for the best method to solve a quadratic equation.

I can solve quadratic equations by inspection, finding square roots, using the quadratic formula, and factoring.

I can determine the types and number of solutions of a quadratic equation by analyzing the discriminant.

A.APR.4

I can factor polynomials by applying polynomial identities.

A.SSE.2

I can look for and identify clues in the structure of expressions (e.g., like terms, common factors, difference of squares, perfect squares) in order to rewrite in another way.

I can explain why equivalent expressions are equivalent.

I can apply models for factoring and multiplying polynomials to rewrite expressions.

A.SSE.3a

I can recognize a quadratic function.

I can select a factoring strategy based on number of terms and common factors.

I can factor a quadratic expression ($ax^2 + bx + c$) to find the zeroes of the function it represents.

I can factor a difference of squares to find the zeroes of the function it represents.

Algebra I
Modeling Quadratic Functions

Standards

FN.Q.A. Reason quantitatively and use units to solve problems.
A.SSE.A. Interpret the structure of expressions.
A.CED.A. Create equations that describe numbers or relationships.
A.REI.A. Understand solving equations as a process of reasoning and explain the reasoning.

F.IF.4 ★ For a function that models a relationship between two quantities, interpret key features of expressions, graphs and tables in terms of the quantities, and sketch graphs showing key features given a description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. ★

F.IF.7a ★ Graph linear, quadratic and absolute value functions and show intercepts, maxima, minima and end behavior. ★

F.BF.3. Transform parent functions (f(x)) by replacing f(x) with f(x)+k, kf(x), f(kx), and f(x+k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (For (9/10) focus on linear/quadratic/ exponential functions.)

Vocab

Content: counterexample, radical expression, simplest form, rationalizing the denominator, conjugates like radicals, radicand, perfect cube, quadratic equation, square root, discriminant
Academic: Construct, Graph, Apply

Algebra I
Modeling Quadratic Functions

I can

F.IF.4.
I can identify whether the function is linear or quadratic, given its table or graph.
I can identify trends, patterns, intercepts, and symmetry of a function.
I can interpret the key features of graphs and tables of functions in terms of the function's equation.
I can determine if an input value makes sense in the problem.
I can explain what the ordered pairs represent in the context of the situation.
I can sketch graphs showing key features of a function from an equation or verbal description of a relationship.

F.IF.7a
I can graph linear/quadratic functions by hand in simple cases.
I can graph linear/quadratic functions using technology for more complicated cases.
I can identify and show/label the key features of a graph (intercepts, minimum/maximum and end behavior).
I can identify and graph a linear function in point-slope form, slope-intercept form, and standard form.
I can determine the differences between simple and complicated linear and quadratic functions and know when the use of technology is appropriate.
I can relate the coefficients and constants to parts of the equation.

F.BF.3.
I can identify the effect of a single transformation on a graph.
I can distinguish between an even and odd function.
I can explain how f(x) + k translates the original graph up k units and how f(x) – k translates the original graph down k units.
I can explain how f(x+ k) translates the original graph left k units and how f(x-k) translates the original graph right k units.
I can explain how kf(x) dilates the original graph vertically and how f(kx) dilates the original graph horizontally.
I can determine the value of k given an equation or graph.
I can graph a variety of transformations when given a graph of f(x).