EQUITABLE EDUCATION SOLUTIONS

PROMOTING LEARNING FOR ALL STUDENTS

Algebra I

Algebra I

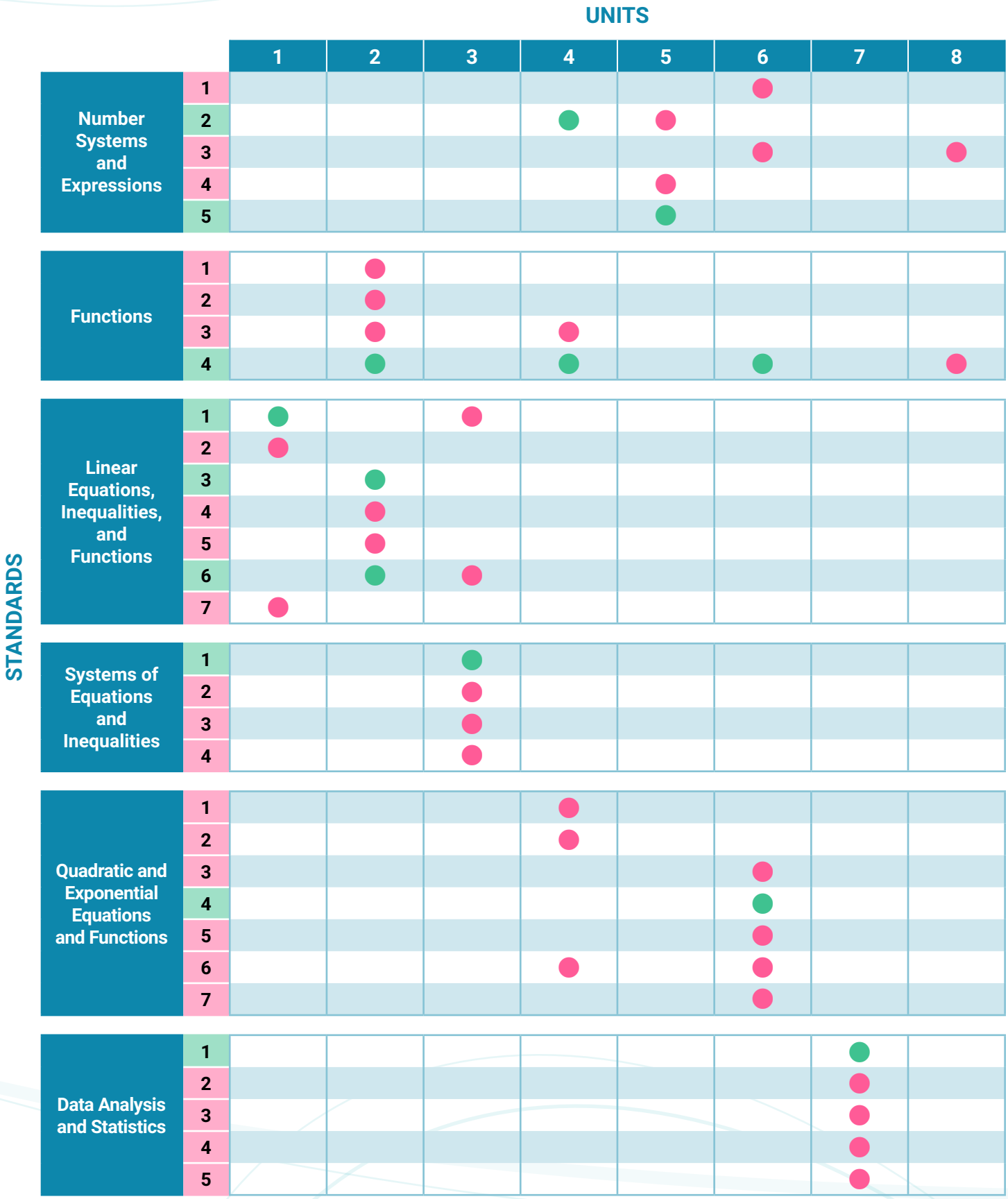
Units of Study

Appendices

EQUITABLE EDUCATION SOLUTIONS
PROMOTING LEARNING FOR ALL STUDENTS

Standards Breakdown

Green: Priority Standards **Pink:** Supporting Standards



General Description of the Unit

In Unit 1, students will use properties of equality and distributive property, among other various strategies, to solve equations and inequalities, and to graph the solution set on a number line. Students will practice explaining their process and justifying their method choice. Students will rewrite equations in function form and solve formulas and literal equations for a given variable. Students will explore the difference between linear and compound inequalities as they write, solve, and graph compound inequalities.

Priority Standards

- **AI.L.1:** Represent real-world problems using linear equations and inequalities in one variable, including those with rational number coefficients and variables on both sides of the equal sign. Solve them fluently, explaining the process used and justifying the choice of a solution method.

Supporting Standards

- **AI.L.7:** Solve linear and quadratic equations and formulas for a specified variable to highlight a quantity of interest, using the same reasoning as in solving equations.
- **AI.L.2:** Solve compound linear inequalities in one variable, and represent and interpret the solution on a number line. Write a compound linear inequality given its number line representation.

Enduring Understandings

- Proportional relationships express how quantities change in relationship to each other.
- Both equations and inequalities utilize properties of equality to solve. However, the solution to an equation represents one value and the solution to an inequality represents a set of values.
- The context of a problem determines the reasonableness of a solution.

Essential Questions

- How does comparing quantities describe the relationship between them?
- What are the similarities and differences in solving and expressing the solutions to equations and inequalities?
- How do I know when a result is reasonable?

Key Concepts

- I can represent real-world problems using linear equations in one variable.
- I can represent real-world problems using linear inequalities in one variable.
- I can represent real-world equations and inequalities with variables on both sides of the equal sign.
- I can solve a variety of linear equations in one variable fluently.
- I can solve a variety of linear inequalities in one variable fluently.

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Related Concepts

- I can solve compound linear inequalities in one variable.
- I can represent the solution to a compound linear inequality in one variable.
- I can interpret the solution to a compound linear inequality in one variable.
- I can write a compound linear inequality given its number line representation.
- I can solve linear equations and formulas for a specified variable.

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Vocabulary

- Solve
- Justify
- Represent
- Interpret
- Determine
- Explain
- Write

• I can justify each step I take in solving a linear equation or inequality.	• I can solve quadratic equations and formulas for a specified variable. • I can extend my understanding of solving equations for a value to solving an equation for a variable.	

Mathematical Processes

PS.1: Make sense of problems and persevere in solving them.

- Explain the meaning of a given problem by analyzing explicit evidence.
- Consider similar problems to gain insights.
- Discuss the different ways to start a given problem and develop a plan for a solution path.
- Evaluate whether my solution makes sense in the context of a problem.
- Build new mathematical knowledge through problem solving.
- Apply and adapt a variety of appropriate strategies to solve problems.
- Monitor and reflect on my progress and change strategy if needed.
- Analyze and evaluate the mathematical thinking and strategies of others.

PS.4: Model with mathematics.

- Apply mathematics to solve problems in everyday life.
- Read a contextual problem and make assumptions and approximations to simplify the problem.
- Explain which quantities are important in a problem and use a variety of tools and representations to show their relationship.
- Select, apply, and translate among a variety of mathematical representations to solve problems.
- Efficiently use technology to clearly present the relationships between mathematical information and ideas.
- Listen to peers explain which representation they used and determine which method was more efficient.
- Express quantitative/technical information in words and as a visual representation.

Resources

Proficiency Scales	Digital	Manipulatives
AI.L.1	Algebra by Example Nail Polish Gas Pump Turbo Texting The "35 Game" Compound Inequalities on a Number Line Absolute Value Equations Buying a Car Bernardo and Sylvia Play a Game Paying the Rent Compound Inequalities Foldable Solving Literal Equations Connect Four	Individual Number Line: *Laminate this document and provide it for each student or group to allow them to use it with a dry erase marker.* Scientific Calculator Candy and Dixie Cups Algebra Tiles (Distributive Property)

School Resources	
Textbook	**Formative Assessments**

General Description of the Unit

In Unit 2, students will review plotting points in a coordinate plane and use tables, x- and y-intercepts, and slope and y-intercept to graph linear equations and functions. They will learn how to use function notation, interpret slope as a rate of change in real-world situations, and explore how changing the slope and y-intercept changes the graph. Students write equations of lines given various features of the line and use the equations and graphs to solve real-world problems. They will explore the qualitative features of a function, and learn to write and graph a function given key features. They graph linear inequalities in two variables, interpret the solution set, and determine its reasonableness.

Priority Standards

- **AI.F.4:** Describe, qualitatively, the functional relationship between two quantities by analyzing key features of a graph. Sketch a graph that exhibits given key features of a function that has been verbally described, including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values, Identify the independent and dependent variables.
- **AI.L.3:** Represent linear functions as graphs from equations (with and without technology), equations from graphs, and equations from tables and other given information (e.g., from a given point on a line and the slope of the line). Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line.
- **AI.L.6:** Represent real-world problems using linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Graph the solutions to a linear inequality in two variables as a half-plane.

Supporting Standards

- **AI.F.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. Understand that if f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. Understand the graph of f is the graph of the equation y = f(x) with points of the form (x, f(x)).
- **AI.F.2:** Evaluate functions for given elements of its domain, and interpret statements in function notation in terms of a context.
- **AI.F.3:** Identify the domain and range of relations represented in tables, graphs, verbal descriptions, and equations.
- **AI.L.4:** Represent real-world problems that can be modeled with a linear function using equations, graphs, and tables; translate fluently among these representations, and interpret the slope and intercepts.
- **AI.L.5:** Translate among equivalent forms of equations for linear functions, including slope-intercept, point-slope, and standard. Recognize that different forms reveal more or less information about a given situation.

Enduring Understandings

- A different representation highlights different features to a function, such as the input, output, slope, solution (or solution set), and intercepts.
- Domain and range influence the slope of a function, which can tell the learner more about the rate of change of the situation.

Essential Questions

- Why is it useful to use multiple representations of linear equations and inequalities?
- Why is it important to consider slope, domain, and range in problem situations?

Key Concepts

- I can graph a linear equation given its equation with technology.
- I can graph a linear equation given its equation without technology.
- I can write a linear equation given its graph.
- I can identify the slope and y-intercept given a graph, equation, or table.
- I can write a linear equation given a table of values.
- I can write a linear equation given the slope and a point on the line.
- I can write a linear equation given two points on the line.
- I can write the equation of a line that is parallel to a given line and through a given point.
- I can write the equation of a line that is perpendicular to a given line and through a given point.
- I can write a linear inequality in two variables to represent real-world problems.
- I can graph a linear inequality in two variables that represents a real-world problem.
- Given a graph of a linear inequality that represents a real-world problem, I can identify and interpret the solution set.
- I can assess the reasonableness of the solution set of a linear inequality.
- I can describe the relationship between two quantities by analyzing a graph.
- I can sketch the intercepts of a graph described verbally.

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Related Concepts

- I can write the equation of a linear function to model a real-world situation.
- I can translate among linear representations.
- I can identify the slope and y-intercept of a linear function in the context of a real-world situation.
- I can interpret the slope and y-intercept of a linear function that represents a real-world situation.
- I can identify a linear function as being written in either slope-intercept form, point-slope form, or standard form.
- I can manipulate a linear function written in any form to another form.
- I can identify the benefits of writing a linear function in various forms.
- I can determine whether a relation is a function given a set of ordered pairs, a table, mapping diagram or a graph.
- I can represent relations and functions using concrete, verbal, numeric, graphic, and algebraic forms.
- Given one representation, I can represent a relation or function in another form.
- I can find f(x) for each x in the domain of f.
- I can relate (x, y) to (x, f(x)).
- I can evaluate functions for given elements of its domain.
- I can interpret statements in function notation in terms of a context.
- I can describe the domain and range of relations represented in a table.

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Vocabulary

- Describe
- Represent
- Graph
- Translate
- Interpret
- Solve
- Identify
- Write
- Explain
- Justify
- Predict
- Find
- Evaluate

• I can sketch the intervals of increase and decrease of a graph described verbally. • I can sketch the intervals where a function is positive or negative, described verbally. • I can sketch any relative maximum or minimum values of a graph described verbally. • I can identify the independent and dependent variables of a function described verbally. • I can sketch a graph that exhibits key qualitative features that have been verbally described.	• I can describe the domain and range of relations represented in a graph. • I can describe the domain and range of relations represented in an equation. • I can describe the domain and range of relations stated verbally.	

Mathematical Processes

PS.4: Model with mathematics.

- Apply mathematics to solve problems in everyday life.
- Read a contextual problem and make assumptions and approximations to simplify the problem.
- Explain which quantities are important in a problem and use a variety of tools and representations to show their relationship.
- Select, apply, and translate among a variety of mathematical representations to solve problems.
- Efficiently use technology to clearly present the relationships between mathematical information and ideas.
- Listen to peers explain which representation they used and determine which method was more efficient.
- Express quantitative/technical information in words and as a visual representation.

PS.7: Look for and make use of structure.

- Identify patterns or structure in situations.
- Change perspective and see things as single objects or as composed of several objects.
- Listen for patterns in the words used during instruction.
- Identify patterns in a problem set.
- Create a problem based on mathematical properties and structures.
- Use what I already know about math to solve new problems.
- Explain why and when properties of operations are true in a context.

Resources

Proficiency Scales	Digital	Manipulatives
AI.F.4 AI.L.3 AI.L.6	Function Carnival Point Collector: Lines Absolute Value Graphs The Fire Station Problem Polygraph: Absolute Value Lego Prices	Graphing Calculator Scientific Calculator Function Machine Coordinate Grid Quadrant One Grid

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	Marbleslides: Lines **Picture Perfect** **Yam in the Oven** **Domain and Range** (When Math Happens) **Domain and Range** (Smiley Faces) **Domain and Range** (Open Middle) **Domain & Range** **Average Cost** **The Date Game** **Parking Lot** **Function Carnival, 2**	

School Resources

Textbook	**Formative Assessments**

General Description of the Unit

In Unit 3, students will use graphing, substitution, and elimination to solve systems of linear equations. They will identify linear systems as having one solution, no solution, or infinitely many solutions. Students will solve and graph systems of linear inequalities.

Priority Standards

- **AI.SEI.1:** Understand the relationship between a solution of a system of two linear equations in two variables and the graphs of the corresponding lines. Solve pairs of linear equations in two variables by graphing; approximate solutions when the coordinates of the solution are non-integer numbers.

Supporting Standards

- **AI.L.1:** Represent real-world problems using linear equations and inequalities in one variable, including those with rational number coefficients and variables on both sides of the equal sign. Solve them fluently, explaining the process used and justifying the choice of a solution method.
- **AI.L.6:** Represent real-world problems using linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Graph the solutions to a linear inequality in two variables as a half-plane.
- **AI.SEI.2:** Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions, including cases with no solution and infinitely many solutions. Solve systems of two linear equations algebraically using elimination and substitution methods.
- **AI.SEI.3:** Write a system of two linear equations in two variables that represents a real-world problem and solve the problem with and without technology. Interpret the solution and determine whether the solution is reasonable.
- **AI.SEI.4:** Represent real-world problems using a system of two linear inequalities in two variables. Graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes with and without technology. Interpret the solution set and determine whether it is reasonable.

Enduring Understandings

- We can find the solution or solution set that satisfies both equations.
- Solving real-world situations without using a system of linear equations and inequalities can take time.
- Writing and solving a system of linear equations or inequalities to represent a real world situation can be an efficient strategy to find a solution or solution set for both situations provided in the real-world scenario.
- There can be different strategies to solve a problem but some are more effective and/or efficient than others.

Essential Questions

- What can we do with a system of equations and/or inequalities that we cannot do with a single equation or inequality?
- How are systems of linear equations and inequalities useful in interpreting real-world situations?
- How do I decide what strategy will work best in a given problem situation?

Key Concepts

- I can identify the solution to a system of linear equations given the graph as the point of intersection.
- I can substitute the point of intersection of a system of linear equations into each equation to verify the point of intersection is the solution to the pair of linear equations.
- I can approximate the solution to a system linear equations graphically and assess the reasonableness of my estimation.

Related Concepts

- I can use the elimination method for solving a system of two linear equations.
- I can determine the factor by which one equation should be multiplied to create an equivalent system of linear equations.
- I can use the substitution method for solving a system of two linear equations.
- I can identify if a system of two linear equations has one solution, no solution, or infinitely many solutions graphically.
- I can identify if a system of two linear equations has one solution, no solution, or infinitely many solutions algebraically.
- I can write a system of linear equations to represent a real-world problem.
- I can solve a system of linear equations representing a real-world problem using any method (graphing, elimination, substitution).

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Vocabulary

- Represent
- Solve
- Write
- Interpret
- Determine
- Explain
- Justify
- Graph
- Approximate
- Identify

	• I can interpret and assess the solution to a system of linear equations representing a real-world problem. • I can write a system of linear inequalities in two variables to represent a real-world problem. • I can graph a system of linear inequalities in two variables and identify the solution set. • I can decide if the solution set of a system of linear inequalities is reasonable in context. • I can represent real-world problems using linear equations in one variable. • I can represent real-world problems using linear inequalities in one variable. • I can represent real-world equations and inequalities with variables on both sides of the equal sign. • I can solve a variety of linear equations in one variable fluently. • I can solve a variety of linear inequalities in one variable fluently. • I can justify each step I take in solving a linear equation or inequality. • I can write a linear inequality in two variables to represent real-world problems. • I can graph a linear inequality in two variables that represents a real-world problem. • Given a graph of a linear inequality that represents a real-world problem, I can identify and interpret the solution set. • I can assess the reasonableness of the solution set of a linear inequality.	

Mathematical Processes

PS.5: Use tools appropriately.

- Consider a variety of tools necessary to solve a specific math problem.
- Explain why a particular tool is more suitable than another.
- Identify keywords in the instructions to choose the appropriate tools.
- Navigate and evaluate the appropriate use of technology in my learning of mathematics.

PS.3: Construct convincing arguments and critique the reasoning of others.

- Understand and use stated assumptions, definitions, and previous results. I can verbally justify my conclusions.
- Use deductive and inductive reasoning to construct convincing arguments about a given situation.
- Write a plan, using appropriate reference materials, to solve a given problem.
- Explain a flaw in an argument, if necessary.
- Draw evidence from informational mathematical texts to support analysis, reflection, and research.
- Write arguments focused on mathematical content.
- Provide counterexamples where appropriate.
- Actively listen to and critique the arguments of others.
- Compare two plausible arguments.
- Pose questions to another's argument in an effort to clarify or strengthen the argument.
- Justify my reasoning for my solution making sense.
- Make and investigate mathematical conjectures.

Resources

Proficiency Scales

AI.SEI.1

Digital

Polygraph – Linear Systems

Solutions to Systems of Linear Equations

Wafers and Creme

Playing Catch Up

Boats in Motion

Elevator or Stairs?

Manipulatives

Graphing Calculator

Coordinate Grid

Quadrant One Grid

Scientific Calculator

School Resources	
Textbook	**Formative Assessments**

General Description of the Unit

In Unit 4, students will learn and use properties of exponents to evaluate and simplify algebraic expressions. They will graph and write rules for exponential functions including exponential growth and exponential decay while also describing their qualitative features. Students will explore the difference in situations that can be modeled with linear functions or exponential functions.

Priority Standards

- **AI.NE.2:** Simplify algebraic rational expressions, with numerators and denominators containing monomial bases with integer exponents, to equivalent forms.
- **AI.F.4:** Describe, qualitatively, the functional relationship between two quantities by analyzing key features of a graph. Sketch a graph that exhibits given key features of a function that has been verbally described, including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values. Identify the independent and dependent variables.

Supporting Standards

- **AI.F.3:** Identify the domain and range of relations represented in tables, graphs, verbal descriptions, and equations.
- **AI.QE.1:** Distinguish between situations that can be modeled with linear functions and with exponential functions. Understand that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. Compare linear functions and exponential functions that model real-world situations using tables, graphs, and equations.
- **AI.QE.2:** Represent real-world and other mathematical problems that can be modeled with simple exponential functions using tables, graphs, and equations of the form y = ab^x (for integer values of x > 1, rational values of b > 0 and b ≠ 1) with and without technology; interpret the values of a and b.
- **A1.QE.6:** Graph exponential and quadratic functions with and without technology. Identify and describe key features, such as zeros, lines of symmetry, and extreme values in real-world and other mathematical problems involving quadratic functions with and without technology; interpret the results in the real-world contexts.

Enduring Understandings

- The properties of exponents are used to simplify an algebraic expression, resulting in an expression that is simpler to compute.
- A calculator can be used to evaluate a numeric expression after the properties of exponents have been applied to simplify the expression.
- If the difference between successive terms is constant, the function is linear and if the ratio of successive terms is constant, the function is exponential.

Essential Questions

- How do the properties of exponents assist in computation?
- When should one use a calculator?
- Given a real-world set of data, how could one differentiate an exponential model from a linear model?

Key Concepts

- I can describe the relationship between two quantities by analyzing a graph.
- I can sketch the intercepts of a graph described verbally.
- I can sketch the intervals of increase and decrease of a graph described verbally.
- I can sketch the intervals where a function is positive or negative, described verbally.
- I can sketch any relative maximum or minimum values of a graph described verbally.
- I can identify the independent and dependent variables of a function described verbally.
- I can sketch a graph that exhibits key qualitative features that have been verbally described.
- I can simplify rational expressions containing monomial bases with integer exponents in the numerator and/or denominator using the properties of exponents.
- I can divide monomials.

Related Concepts

- I can describe the domain and range of relations represented in a table.
- I can describe the domain and range of relations represented in a graph.
- I can describe the domain and range of relations represented in an equation.
- I can describe the domain and range of relations stated verbally.
- I can give examples of situations that would be modeled with a linear function and those that would be modeled with an exponential function.
- I can identify an exponential function graphically, numerically, and algebraically.
- I can identify a linear function graphically, numerically, and algebraically.
- I can find the constant rate of change or the constant ratio of change given a table, graph, or equation.
- I can model real-world situations both exponentially and linearly using tables, graphs, or equations.
- I can model simple exponential functions graphically, numerically, and algebraically with technology.
- I can model simple exponential functions graphically, numerically, and algebraically without technology.
- I can extend my understanding of exponential functions to real-world situations.

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Vocabulary

- Graph
- Represent
- Interpret
- Translate
- Distinguish
- Compare
- Write
- Evaluate
- Describe
- Simplify
- Justify
- Explain
- Identify
- Find

	• I can describe the important values of an exponential function and how they present in an equation, table, or graph. • I can interpret the values of a and b in y = ab^x in context. • I can graph an exponential function with and without technology.	

Mathematical Processes

PS.7: Look for and make use of structure.

- Identify patterns or structure in situations.
- Change perspective and see things as single objects or as composed of several objects.
- Listen for patterns in the words used during instruction.
- Identify patterns in a problem set.
- Create a problem based on mathematical properties and structures.
- Use what I already know about math to solve new problems.
- Explain why and when properties of operations are true in a context.

PS.8: Look for and express regularity in repeated reasoning.

- Notice if calculations are repeated and use that information to solve problems.
- Understand and apply various rules and formulas as described by others.
- Identify general rules from examples of a problem set.
- Describe how two separate problems are solved using the same method.
- Apply previously used strategies to solve new problems.
- Self-assess to see whether a strategy makes sense as I work.

Resources

Proficiency Scales	Digital	Manipulatives
AI.NE.2	Polygraph: Exponential	Graphing Calculator
AI.F.4	Penny Circle	Coordinate Grid
	Compound Interest	Quadrant One Grid
	Exponential Functions	Scientific Calculator
	Linear v. Exponential	Exponential Chips
	One Grain of Rice	
	Avi and Benita's Repair Shop	
	Identifying Exponential Functions	
	Exponential Functions	
	Mistakes to the Half Power	
	Evaluating Exponential Expressions	

School Resources	
Textbook	**Formative Assessments**

General Description of the Unit

In Unit 5, students will add, subtract, multiply, and divide polynomials. Students will factor polynomials using a variety of techniques.

Priority Standards

- **AI.NE.5:** Add, subtract, and multiply polynomials. Divide polynomials by monomials.

Supporting Standards

- **AI.NE.4:** Factor quadratic expressions (including the difference of two squares, perfect square trinomials and other quadratic expressions).
- **AI.NE.2:** Simplify algebraic rational expressions, with numerators and denominators containing monomial bases with integer exponents, to equivalent forms.

Enduring Understandings

- When adding polynomials, we combine like terms to find the sum without using properties of exponents. When multiplying polynomials, we utilize properties of exponents to write the product.
- The properties of real numbers can be used to multiply polynomials or simplify a polynomial expression.
- Factoring polynomials is the process of determining the product of polynomials that result in the given quadratic expression.

Essential Questions

- How does adding and multiplying polynomials differ?
- How are the properties of real numbers related to polynomials?
- How does factoring polynomials relate to multiplying polynomials?

Key Concepts

- I can add polynomials.
- I can subtract polynomials.
- I can multiply polynomials.
- I can divide polynomials by a monomial.

Related Concepts

- I can factor the difference of two squares.
- I can factor perfect square trinomials.
- I can factor quadratic expressions.
- I can simplify rational expressions containing monomial bases with integer exponents in the numerator and/or denominator using the properties of exponents.
- I can divide monomials.

Vocabulary

- Write
- Simplify
- Evaluate
- Multiply
- Divide
- Add
- Subtract
- Find
- Factor
- Explain
- Justify
- Classify

Mathematical Processes

PS.6: Attend to precision.

- Communicate precisely to others.
- Identify and use symbols and vocabulary appropriately.
- Identify the appropriate mathematical language in another student's explanation of a problem.
- Accurately translate literal expressions into mathematical expressions.
- Accurately determine the unit of measure of a given problem.
- Review answers and check for accuracy within the problem.
- List the steps necessary to solve a problem accurately.

PS.7: Look for and make use of structure.

- Identify patterns or structure in situations.
- Change perspective and see things as single objects or as composed of several objects.
- Listen for patterns in the words used during instruction.
- Identify patterns in a problem set.
- Create a problem based on mathematical properties and structures.
- Use what I already know about math to solve new problems.
- Explain why and when properties of operations are true in a context.

Resources

Proficiency Scales

AI.NE.5

Digital

Seeing Dots

Non-Negative Polynomials

Adding and Subtracting Polynomials

Manipulatives

Algebra Tiles

Multiplication Chart

Polyominoes

Scientific Calculator

School Resources

Textbook

Formative Assessments

General Description of the Unit

In Unit 6, students will solve polynomial equations by factoring, using the quadratic formula, and using square roots. Students will explore the process of completing the square to solve quadratic equations and connect the process to the quadratic formula. They will learn to simplify square roots of non-perfect square integers and algebraic monomials, including complex numbers. Students will graph quadratic functions and solve them. While graphing, students will identify and describe key features of the functions. They will write and solve quadratic functions to represent a real-world situation.

Priority Standards

- **AI.F.4:** Describe, qualitatively, the functional relationship between two quantities by analyzing key features of a graph. Sketch a graph that exhibits given key features of a function that has been verbally described, including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values. Identify the independent and dependent variables.
- **AI.QE.4:** Solve quadratic equations in one variable by inspection (e.g., for x^2 = 49), finding square roots, using the quadratic formula, and factoring, as appropriate to the initial form of the equation.

Supporting Standards

- **AI.NE.3:** Simplify square roots of monomial algebraic expressions, including non-perfect squares.
- **AI.NE.1:** Explain the hierarchy and relationships of numbers and sets of numbers within the complex number system. Know that there is an imaginary number, i , such that √− 1 = i. Understand that the imaginary numbers along with the real numbers form the complex number system.
- **AI.QE.3:** Use area models to develop the concept of completing the square to solve quadratic equations. Explore the relationship between completing the square and the quadratic formula.
- **AI.QE.5:** Represent real-world problems using quadratic equations in one or two variables and solve such problems with technology. Interpret the solution(s) and determine whether they are reasonable.
- **A1.QE.6:** Graph exponential and quadratic functions with and without technology. Identify and describe key features, such as zeros, lines of symmetry, and extreme values in real-world and other mathematical problems involving quadratic functions with and without technology; interpret the results in the real-world contexts.
- **AI.QE.7:** Describe the relationships among a solution of a quadratic equation, a zero of the function, an x-intercept of the graph, and the factors of the expression. Explain that every quadratic has two complex solutions, which may or may not be real solutions.

Enduring Understandings

- Certain methods of solving a quadratic equation can be more efficient depending on the solutions of the equation and the format of the original equation.
- Quadratic equations can represent real-world situations that are parabolic like determining a product's profit, formulating the speed of an object, or calculating the height of a ball thrown in the air.
- The vertex of a parabola is the maximum or minimum value of a quadratic function, depending on how the parabola opens. The vertex provides the maximum or minimum value of the scenario it is modeling.

Essential Questions

- Why is it advantageous to know a variety of ways to solve a quadratic equation?
- How are quadratic equations used to solve real-world situations?
- How can quadratic functions maximize profits or minimize costs?

Key Concepts

- I can describe the relationship between two quantities by analyzing a graph.
- I can sketch the intercepts of a graph described verbally.
- I can sketch the intervals of increase and decrease of a graph described verbally.
- I can sketch the intervals where a function is positive or negative, described verbally.
- I can sketch any relative maximum or minimum values of a graph described verbally.
- I can identify the independent and dependent variables of a function described verbally.
- I can sketch a graph that exhibits key qualitative features that have been verbally described.
- I can solve quadratic equations by using square roots.
- I can write a quadratic equation in standard form in order to identify the correct values to be used in the quadratic formula.

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Related Concepts

- I can simplify square roots of non-perfect squares.
- I can simplify square roots of monomial algebraic expressions.
- I can classify numbers and sets of numbers within the complex number system.
- I can identify numbers as rational or irrational.
- I can classify rational numbers as integers, whole numbers, and natural numbers.
- I can define and identify imaginary numbers.
- I can classify numbers and sets of numbers within the complex number system.
- I can represent a quadratic expression using an area model.
- I can use area models to develop the concept of completing the square as a method for solving quadratic equations.

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Vocabulary

- Simplify
- Solve
- Describe
- Graph
- Find
- Interpret
- Determine
- Represent
- Write
- Approximate
- Translate
- Evaluate
- Compare

• I can solve a quadratic equation by using the quadratic formula. • I can solve a quadratic equation by using a variety of factoring techniques. • I can explain the zero-product property and how it relates to solving a quadratic equation by factoring. • I can determine which strategy for solving quadratic equations is most appropriate given an initial equation.	• I can describe the relationship between completing the square and the quadratic formula. • I can represent real-world problems using quadratic equations in one variable. • I can represent real-world problems using quadratic equations in two variables. • I can solve a real-world problem modeled with a quadratic equation using technology. • I can interpret the solution(s) to a quadratic equation in the context of a real-world problem and determine their reasonableness. • I can graph an exponential function with and without technology. • I can graph a quadratic function with and without technology. • I can graph various transformations of the parent quadratic function. • I can use a variety of factoring techniques to find the zeros of a quadratic function. • I can locate the line of symmetry of a parabola as the vertical line that goes through the point directly in the middle of the zeros. • I can determine the maximum/minimum value of a quadratic function using the line of symmetry and the equation. • I can analyze key features of a parabola and discuss their relevance in real-world context. • I can discuss the connection between the solutions of a quadratic equation, the zeros of the function, and the x-intercepts of the graph, and the factors of the expression. *(continued on next page)*	

	• I can compare the factors of a quadratic expression to the solutions of a quadratic function. • I can explain that all quadratic equations have two complex solutions, which may or may not be real algebraically. • I can explain that all quadratic equations have two complex solutions, which may or may not be real graphically.	

Mathematical Processes

PS.3: Construct convincing arguments and critique the reasoning of others.

- Understand and use stated assumptions, definitions, and previous results. I can verbally justify my conclusions.
- Use deductive and inductive reasoning to construct convincing arguments about a given situation.
- Write a plan, using appropriate reference materials, to solve a given problem.
- Explain a flaw in an argument, if necessary.
- Draw evidence from informational mathematical texts to support analysis, reflection, and research.
- Write arguments focused on mathematical content.
- Provide counterexamples where appropriate.
- Actively listen to and critique the arguments of others.
- Compare two plausible arguments.
- Pose questions to another's argument in an effort to clarify or strengthen the argument.
- Justify my reasoning for my solution making sense.
- Make and investigate mathematical conjectures.

PS.5: Use appropriate tools strategically.

- Consider a variety of tools necessary to solve a specific math problem.
- Explain why a particular tool is more suitable than another.
- Identify keywords in the instructions to choose the appropriate tools.
- Navigate and evaluate the appropriate use of technology in my learning of mathematics.

Resources

Proficiency Scales	Digital	Manipulatives
AI.F.4 AI.QE.4	Graphing Stories – 15 Seconds at a Time Graphing Stories (Desmos) Graph Stories: Where English meets Math Hoisting the Flag 1 Hoisting the Flag Match my parabola	Algebra Tiles Graphing Calculator Coordinate Grid Quadrant One Grid Scientific Calculator Multiplication Chart Factor Tree

(continued on next page)

	Open Middle – Quadratic Formula Exploring Quadratic Functions Through Images Perimeter Jumble Build a Bigger Field Intercepts, Zeros, Roots, Factors, & Solutions Zero Product Property Card Sort: Parabolas	

School Resources

Textbook	Formative Assessments

General Description of the Unit

In Unit 7, students will make scatter plots of data and use the best-fitting line to model data to make predictions. Using technology, students will calculate and interpret the correlation coefficient of a linear function. Students will explore trends in data and possible associations by using two-way and relative frequency tables to summarize bivariate categorical data. They will analyze surveys and experiments and determine how randomization relates. Students will explain how data and statistics might be represented in a misleading manner.

Priority Standards

- **AI.DS.1:** Understand statistics as a process for making inferences about a population based on a random sample from that population. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

Supporting Standards

- **AI.DS.2:** Understand that statistics and data are non-neutral and designed to serve a particular interest. Analyze the possibilities for whose interest might be served and how the representations might be misleading.
- **AI.DS.3:** Use technology to find a linear function that models a relationship between two quantitative variables to make predictions, and interpret the slope and y-intercept. Using technology, compute and interpret the correlation coefficient.
- **AI.DS.4:** Describe the differences between correlation and causation.
- **AI.DS.5:** Summarize bivariate categorical data in two-way frequency tables. Interpret relative frequencies in the contexts of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in data.

Enduring Understandings

- Measures of central tendency are statistical summaries that represent the central point or value of a dataset. Each method of central tendency calculates the central value using a different method, which should be chosen depending on the type of data given.
- The way that data is collected, organized and displayed influences interpretation.
- Visual models illustrate the correlation of bivariate data.
- The context of a problem determines the reasonableness of a solution.

Essential Questions

- Why is it important to be able to represent data using graphs and measures of central tendency?
- How can the same data lead to different conclusions?
- How do we determine if different quantities are correlated to each other?
- How do I know when a result is reasonable?

Key Concepts

- I can distinguish between the population and a sample of the population.
- I can make inferences about a population based on a random sample from that population.
- I can recognize the differences among sample surveys, experiments, and observational studies.
- I can explain how randomization relates to sample surveys, experiments, and observational studies.

Related Concepts

- I can understand that numbers are neutral but data is non-neutral.
- I can argue the idea that data is gathered to serve interests.
- I can identify sources of bias in data reporting or misleading representation of data.
- I can use technology to find a linear function that models a relationship between two quantitative variables in a scatter plot.
- I can use a linear model to make predictions beyond and within the data set.
- I can interpret the slope and y-intercept found in the context of the data graphed.
- I can use technology to find the correlation coefficient of a linear model for a scatter plot.
- Given the correlation coefficient, I can assess the accuracy of my predictions beyond and within the data set.
- I can differentiate between the definitions of correlation and causation.
- I can identify causal fallacies such as common underlying cause or coincidence and apply this knowledge to real-world situations.
- I can determine if the relationship between bivariate data is correlated or causal.
- I can summarize bivariate categorical data in a two-way table.
- I can interpret relative frequencies in the context of data.

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Vocabulary

- Graph
- Analyze
- Classify
- Determine
- Identify
- Design
- Interpret
- Justify
- Construct
- Describe
- Distinguish
- Evaluate
- Infer
- Predict

	• I can interpret joint relative frequencies in the context of data. • I can interpret marginal relative frequencies in the context of data. • I can interpret conditional relative frequencies in the context of data. • I can recognize possible associations and trends in data.	

Mathematical Processes

PS.2: Reason abstractly and quantitatively.

- Make sense of quantities and their relationships in problem situations.
- Contextualize a problem.
- Decontextualize a problem.
- Pause at any moment during the de-contextualizing process and explain the meaning behind a symbol.
- Flexibly use different properties of operations.
- Determine the meaning of symbols, key terms, and other mathematical words or phrases and how they contribute to the solution pathway.

PS.3: Construct convincing arguments and critique the reasoning of others.

- Understand and use stated assumptions, definitions, and previous results. I can verbally justify my conclusions.
- Use deductive and inductive reasoning to construct convincing arguments about a given situation.
- Write a plan, using appropriate reference materials, to solve a given problem.
- Explain a flaw in an argument, if necessary.
- Draw evidence from informational mathematical texts to support analysis, reflection, and research.
- Write arguments focused on mathematical content.
- Provide counterexamples where appropriate.
- Actively listen to and critique the arguments of others.
- Compare two plausible arguments.
- Pose questions to another's argument in an effort to clarify or strengthen the argument.
- Justify my reasoning for my solution making sense.
- Make and investigate mathematical conjectures.

Resources		
Proficiency Scales	**Digital**	**Manipulatives**
AI.DS.1	Strict Parents Measuring Study Effectiveness Experiments and the Role of Random Assignment Non-Linear Association Lighting the Candle Scatter Diagram Used Subaru Foresters I Sugar Prices Estimating Ages of Famous People Beats to West Lego Prices Coffee and Crime Applying Correlation Coefficients: Educational Attainment and Unemployment You and Michael Snakes Correlation vs. Causation in the Media Correlation or Causation: That is the Question Two-Way Tables: Walking and Bicycling to Work A Sweet Task Musical Preferences How Random is "Shuffle Mode"?	Modeling NCTM Tools Graphing Calculator Coordinate Grid Quadrant One Grid Scientific Calculator

School Resources	
Textbook	**Formative Assessments**

General Description of the Unit

In Unit 8, students will graph square root functions. They will add, subtract, multiply, and divide square roots. Students will solve square root equations including equations with extraneous solutions. They apply the Pythagorean Theorem as well as the distance and midpoint formulas to solve real-world problems.

Priority Standards

- There are no priority standards for this unit, as it is an introductory unit to Geometry and Algebra II.

Supporting Standards

- **AI.NE.3:** Simplify square roots of monomial algebraic expressions, including non-perfect squares.
- **AI.F.4:** Describe, qualitatively, the functional relationship between two quantities by analyzing key features of a graph. Sketch a graph that exhibits given key features of a function that has been verbally described, including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values. Identify the independent and dependent variables.

Enduring Understandings

- The Pythagorean Theorem can be used to find the distance between two locations on a coordinate grid.
- The distance formula can be derived from the Pythagorean Theorem, but can be applied in a different contextual situation.
- In order for a square root function, f(x), to have real values, the domain must result in a radicand value greater or equal to zero.

Essential Questions

- How can the Pythagorean Theorem be applied in a real-world situation?
- How does the Pythagorean Theorem relate to the distance formula?
- What must be considered when finding the domain of a square root function?
- Are all solutions to a square root equation valid?

Key Concepts

- N/A

Related Concepts

- I can simplify square roots of non-perfect squares.
- I can simplify square roots of monomial algebraic expressions.
- I can describe the relationship between two quantities by analyzing a graph.
- I can sketch the intercepts of a graph described verbally.
- I can sketch the intervals of increase and decrease of a graph described verbally.

(continued on next page)

Vocabulary

- Identify
- Describe
- Graph
- Determine
- Simplify

	• I can sketch the intervals where a function is positive or negative, described verbally. • I can sketch any relative maximum or minimum values of a graph described verbally. • I can identify the independent and dependent variables of a function described verbally. • I can sketch a graph that exhibits key qualitative features that have been verbally described.	

Mathematical Processes

PS.6: Attend to precision.

- Communicate precisely to others.
- Identify and use symbols and vocabulary appropriately.
- Identify the appropriate mathematical language in another student's explanation of a problem.
- Accurately translate literal expressions into mathematical expressions.
- Accurately determine the unit of measure of a given problem.
- Review answers and check for accuracy within the problem.
- List the steps necessary to solve a problem accurately.

PS.8: Look for and express regularity in repeated reasoning.

- Notice if calculations are repeated and use that information to solve problems.
- Understand and apply various rules and formulas as described by others.
- Identify general rules from examples of a problem set.
- Describe how two separate problems are solved using the same method.
- Apply previously used strategies to solve new problems.
- Self-assess to see whether a strategy makes sense as I work.

Resources

Proficiency Scales	Digital	Manipulatives
N/A	Polygraph: Square Root Functions Solving Radical Equations	Graphing Calculator Coordinate Grid Quadrant One Grid Scientific Calculator Multiplication Chart Factor Tree

School Resources	
Textbook	**Formative Assessments**

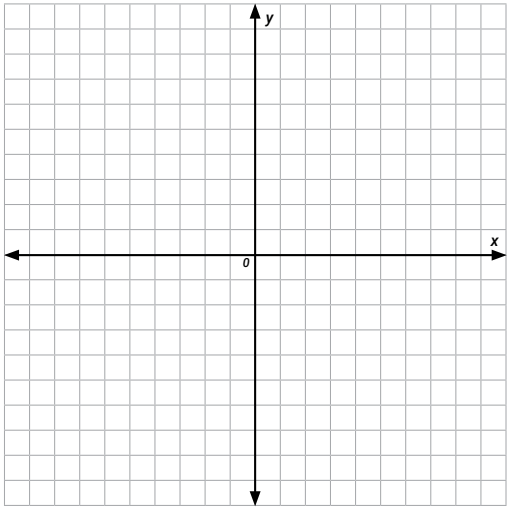
AI.L.1 Proficiency Scale

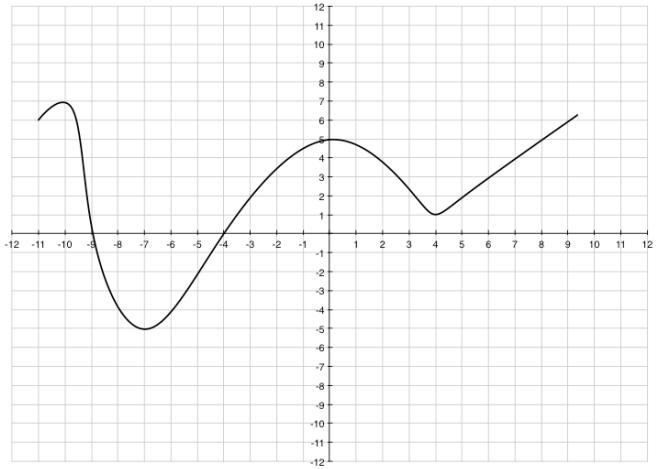
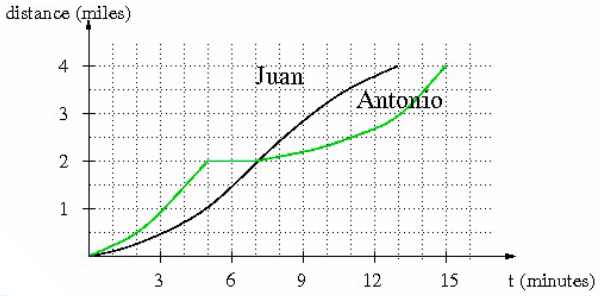
Subject: Math	**Course:** Algebra I	**Strand:** Linear Equations, Inequalities, & Functions
IAS:	**AI.L.1:** Represent real-world problems using linear equations and inequalities in one variable, including those with rational number coefficients and variables on both sides of the equal sign. Solve them fluently, explaining the process used and justifying the choice of a solution method.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Creating an equation that can be solved to derive a given solution. • Utilizing multiple representations to solve a linear equation. • Utilizing multiple representations to solve a linear inequality.	**Sample Task(s)** • Given the solution x = -8, write an equation that requires at least three algebraic properties of equality to solve and result in the provided solution. • Jane was given the equation -3(2x − 4) = -12, but is not familiar with the algebraic properties of equality. What is another method Jane could use to solve the equation? • You need to have at least $100 in your checking account to avoid a low balance fee. You have $247 in your account, and you make withdrawals of $20 per week. What are the possible numbers of weeks that you can withdraw money and avoid paying the fee? Solve this problem using two different methods.
(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	
Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Representing real-world problems using linear equations in one variable. • Representing real-world problems using linear inequalities in one variable. • Representing real-world problems using linear equations and inequalities with rational number coefficients. *(continued on next page)*	• Solve the inequality $-\frac{2}{3}x - 2 < \frac{1}{3}x + 8$ and graph the solution on a number line. Justify each step in solving the inequality. • Describe and correct the error in solving the inequality shown below: $-4(2x - 3) < 28$ $-8x + 12 < 28$ $-8x < 40$ $x > -5$

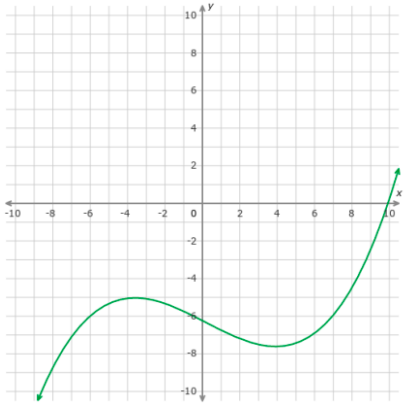
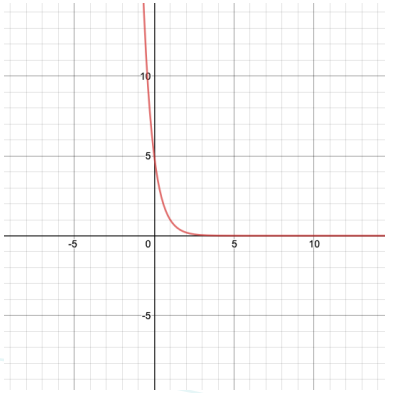
	• Representing real-world problems using linear equations and inequalities with variables on both sides of the equal sign. • Solving linear equations in one variable fluently. • Solving linear inequalities in one variable fluently. • Explaining the process used to solve linear equations in one variable. • Explaining the process used to solve linear inequalities in one variable. • Justifying the choice of solution method in solving a linear equation in one variable. • Justifying the choice of solution method in solving a linear inequality in one variable. **Students are consistently able to apply the grade-level concepts and skills above.**	• A ticket agency sells tickets to a professional basketball game. The agency charges $32.50 for each ticket, a convenience charge of $3.30 for each ticket, and a processing fee of $5.90 for the entire order. The total charge for an order is $220.70. How many tickets were purchased? • A box of cat treats contains at least 50 treats. So far you have fed your cats 18 treats. If you want the box of treats to last 8 days, what are the possible average numbers of treats you can feed the cats per day?
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Describing and correcting an error in the process of solving a linear equation. • Identifying the properties of equality.	**Sample Task(s)** • A student solved the equation $5x - 3(x - 6) = 2$. His work is shown below. *Describe* and *correct* the error(s) in solving the equation. $5x - 3(x - 6) = 2$ $5x - 3x + 18 = 2$ $8x + 18 = 2$ $8x = 20$ $x = 2.5$ • Jake was given the equation $-\frac{4}{3}x + 2 = -8$ and applied an algebraic property of equality and created the equivalent equation $-\frac{4}{3}x = -10$. Which property of equality did he use?

(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.F.4 Proficiency Scale

Subject: Math	**Course:** Algebra I	**Strand:** Functions
IAS:	**AI.F.4:** Describe, qualitatively, the functional relationship between two quantities by analyzing key features of a graph. Sketch a graph that exhibits given key features of a function that has been verbally described, including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values. Identify the independent and dependent variables.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Describing the effects of transformations to a given function f(x). • Writing the equation of a function given a qualitative description of the functional relationship between two quantities.	**Sample Task(s)** • On the same coordinate grid, graph the functions $f(x) = x^2$ and $f(x) = 2x^2 - 1$. Describe the transformation that is made to the function $f(x) = x^2$ to produce the equation $f(x) = 2x^2 - 1$. How do these transformations relate to the equation $f(x) = 2x^2 - 1$?  • Write an equation of a quadratic function that opens down and has zeros (-1, 0), and (3 ,0). • Write the equation of an exponential growth function with a y-intercept of 8 and passes through the point (1, 12.8).

(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	
Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Describing qualitatively the functional relationship between two quantities by analyzing a graph. • Sketching a graph that exhibits the qualitative features of a function that has been verbally described (including intercepts, where the function is increasing or decreasing, where the function is positive or negative, and any relative maximum or minimum values). • Identifying independent and dependent variables. **Students are consistently able to apply the grade-level concepts and skills above.**	• Describe the function below in words so someone could recreate the function.  • Sketch a quadratic function that has a maximum value at (4, 4) and has zeros (2, 0), and (6,0). • Sketch an exponential decay function with a y-intercept of 3 and a decay factor of $\frac{4}{5}$. • Antonio and Juan are in a 4-mile race. The graph shows the distance of each racer (in miles) as a function of time (in minutes).  *(continued on next page)*

		a. Who wins the race? How do you know? b. Imagine you were watching the race and had to announce it over the radio; write a little story describing the race.
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Classifying a graph as linear or nonlinear. • Classifying a graph as exponential or quadratic.	**Sample Task(s)** • The graph shows a function. Is the function linear or nonlinear?  • Classify the function as exponential or quadratic. 

(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.L.3 Proficiency Scale

<table>
<tr><th colspan="2">Subject: Math</th><th>Course: Algebra I</th><th>Strand: Linear Equations, Inequalities, & Functions</th></tr>
<tr><td>IAS:</td><td colspan="3">AI.L.3: Represent linear functions as graphs from equations (with and without technology), equations from graphs, and equations from tables and other given information (e.g., from a given point on a line and the slope of the line). Find the equation of a line, passing through a given point, that is parallel or perpendicular to a given line.</td></tr>
<tr><td>Mastery
(4.0)</td><td colspan="2">Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:
• Finding a missing coordinate to a linear function given two points on the line.
• Determining if a table of values represents a linear function.</td><td>Sample Task(s)
• A line passes through the points (-2, 3), (2, 5), and (6, z). Find the value of z. Justify your reasoning.
• Determine if the given values lie on the same line. If the points lie on the same line, write an equation to represent the linear function.
<table><tr><th>x</th><th>y</th></tr><tr><td>-4</td><td>-2</td></tr><tr><td>2</td><td>2.5</td></tr><tr><td>8</td><td>7</td></tr></table></td></tr>
<tr><td>(3.5)</td><td colspan="2">Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.</td><td></td></tr>
</table>

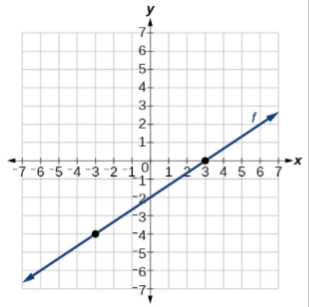
Proficiency (3.0)

Students demonstrate Proficiency on the grade-level standard by:

- Representing linear functions as graphs from equations with technology.
- Representing linear functions as graphs from equations without technology.
- Representing linear functions as equations from graphs.
- Representing linear functions as equations from tables.
- Representing linear functions as equations from other given information (i.e. a given point on the line and the slope).
- Finding the equation of a line, passing through a given point, that is parallel to a given line.
- Finding the equation of a line, passing through a given point, that is parallel to a given line.

Students are consistently able to apply the grade-level concepts and skills above.

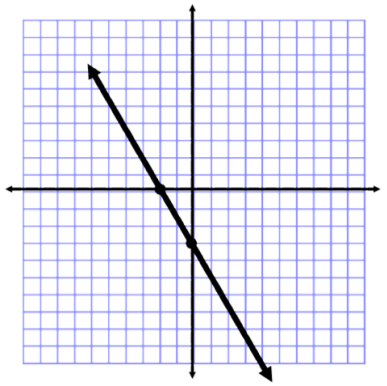
- Complete the various representations of the graph:

Graphical	Numerical
	
Analytical/Algebraic	**Words (Verbal Description)**

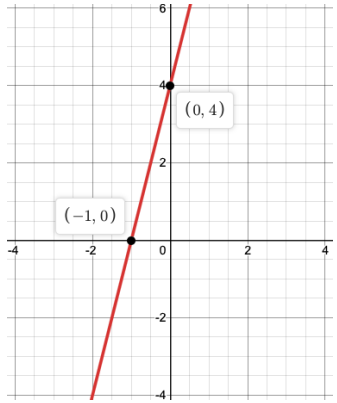
- Graph the equation 8x – 2y=16 using a graphing calculator.
- The table below represents a linear function. What is the slope and y-intercept of the function?

x	-4	-2	0
f(x)	-2	-1	0

- Given the graph below, write a linear function as an equation that models the relationship shown.



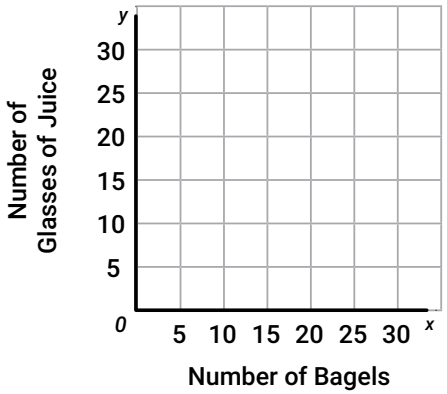
(continued on next page)

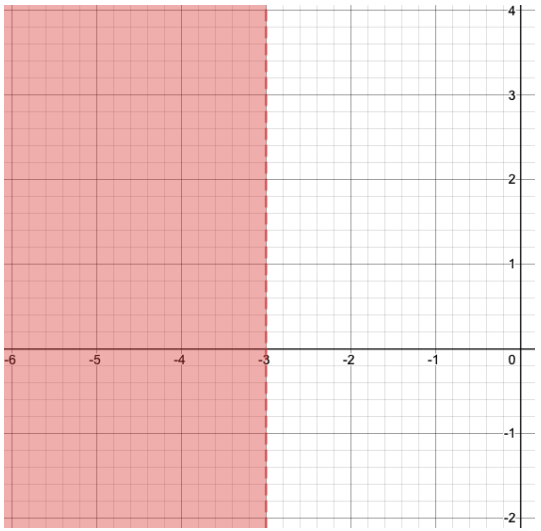
		• Your family spends $50 on tickets to a hockey game and $3 per hour for parking. The total cost C (in dollars) is given by C = 50 + 3t where t is the time (in hours) your family's car is parked. ◦ Graph the equation. ◦ Suppose the parking fee is raised to $4.50/hour so that the total cost of tickets and parking for t hours is C = 50 + 4.50t. Graph the equation in the same coordinate plane as the equation original equation. ◦ How much more does it cost to go to a game for 4 hours after the parking fee is raised? • Write an equation of the line that passes through (-3, 3) and is parallel to the line y + 2x = 1. • Write an equation of the line that passes through (4, -2) and is perpendicular to the line y = 4x + 2.
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Finding the slope of a line that passes through two given points. • Identifying the slope and y-intercept given the graph of a linear function. • Graphing a linear function given the y-intercept and the slope of the line. • Writing a linear function given the slope and y-intercept. • Explaining the relationship between the slopes of parallel lines and perpendicular lines.	**Sample Task(s)** • Find the slope of the line that passes through the points (0, -5) and (1, -3). • Given the graph of the linear function shown below, identify the slope and the y-intercept of the function.  *(continued on next page)*

		• What do we know about the slopes of parallel lines? • What do we know about the slopes of perpendicular lines? • Given the slope of a line is -⅖, find the slope of the line perpendicular. • Graph the linear function that has a y-intercept of 4 and a slope of -½ . • Write an equation of the linear function with a slope of -¾ and a y-intercept of -5.
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.L.6 Proficiency Scale

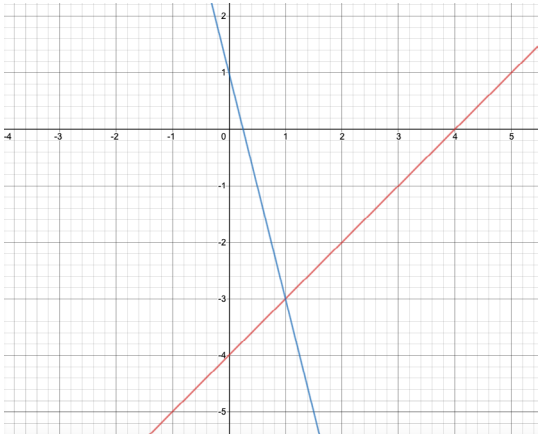
Subject: Math	**Course:** Algebra I	**Strand:** Linear Equations, Inequalities, & Functions
IAS:	**AI.L.6:** Represent real-world problems using linear inequalities in two variables and solve such problems; interpret the solution set and determine whether it is reasonable. Graph the solutions to a linear inequality in two variables as a half-plane.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Describing the difference in the graph of a linear inequality in one variable and a linear inequality in two variables. • Writing a linear inequality in two variables, given solutions of the inequality.	**Sample Task(s)** • How is the graph of a linear inequality in one variable different from the graph of a linear inequality in two variables? Justify your reasoning. • The points (1, 3) and (4, 2) are on the boundary line of a graph, and are solutions of the inequality. The point (7, 8) is also a solution of the inequality. Write the linear inequality in two variables. • For a fundraiser, students offer a basic car wash for $2 and a deluxe car wash for $5. They want to earn at least $100 per day. ◦ Is this situation best represented by a linear inequality or linear equation? ◦ Explain your reasoning, then graph the scenario and provide a combination that meets the students' goal.
(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	

Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Representing real-world problems using linear inequalities in two variables. • Solving real-world problems using linear inequalities in two variables. • Interpreting the solution set of a linear inequality in two variables. • Determining whether the solution set of a linear inequality in two variables is reasonable. • Graphing the solutions to a linear inequality in two variables as a half-plane. **Students are consistently able to apply the grade-level concepts and skills above.**	• For a fundraiser, students offer a basic car wash for $2 and a deluxe car wash for $5. They want to earn at least $100 per day. ◦ Write an inequality that describes the goal. ◦ Graph the inequality. ◦ Identify and interpret one combination that meets the goal. • You and your friends go to a bagel shop for breakfast. Together, you have $20 to spend. Each bagel costs $.75 and each glass of juice costs $.95. Let x represent the number of bagels you can buy. Let y represent the number of glasses of juice you can buy. ◦ Write and graph an inequality that describes the different numbers of bagels and glasses of juice that your group can afford. ◦ Can your group afford 8 bagels and 16 glasses of juice? 
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	

		Sample Task(s)
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Determining whether an ordered pair is a solution to a linear inequality in two variables. • Describing and correcting an error in graphing linear inequalities in two variables. • Defining key terms required for solving linear inequalities in two variables.	• Tell whether the ordered pair (2, -1) is a solution to the linear inequality $x + 2y \leq 4$. • A student graphed the inequality $x \geq -3$ shown below. *Describe* and *correct* the error(s) in graphing the inequality.  • What is a boundary line when graphing linear inequalities in two variables? • What does the term "solution set" mean when graphing linear inequalities in two variables?
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.SEI.1 Proficiency Scale

Subject: Math	**Course:** Algebra I	**Strand:** Systems of Equations and Inequalities
IAS:	**AI.SEI.1:** Understand the relationship between a solution of a pair of linear equations in two variables and the graphs of the corresponding lines. Solve pairs of linear equations in two variables by graphing; approximate solutions when the coordinates of the solution are non-integer numbers.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Writing a linear system of equations that would have a given solution. • Extending understanding of solving linear equations by graphing to solving a mathematical problem involving three or more linear equations.	**Sample Task(s)** • Write a system of linear equations that would have the solution (-3, 3). • Find the values for *m* and *b* so that the system $y = \frac{3}{4}x - 2$ and $y = mx + b$ has (8, 4) as a solution. • The three lines given below form a triangle. Find the coordinates of the vertices of the triangle. $x + 4y = 9$ $2x + y = 11$ $-3x + 2y = 1$
(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	
Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Understanding the relationship between a solution of a pair of linear equations in two variables and the graphs of the corresponding lines. • Solving pairs of linear equations in two variables by graphing. • Approximating solutions when the coordinates of the solution are non-integer numbers. **Students are consistently able to apply the grade-level concepts and skills above.**	• Explain how to solve a linear system of equations by graphing. • Solve the linear system of equations by graphing. Explain why it is important to check your solution. $y - 4x = 1.5$ $2x + y = 1.5$

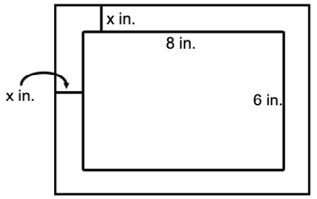
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Determining whether a given ordered pair is a solution to a linear system of equations. • Finding the solution of a given graph of a system of linear equations.	**Sample Task(s)** • Tell whether the ordered pair (-1, 3) is a solution to the linear system of equations. $-2x - 3y = 4$ $2x + 8y = 11$ • Use the graph below to solve the linear system of equations. $x - y = 4$ $4x + y = 1$ 
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.NE.2 Proficiency Scale

Subject: Math	**Course:** Algebra I	**Strand:** Number Systems and Expressions
IAS:	**AI.NE.2:** Simplify algebraic rational expressions, with numerators and denominators containing monomial bases with integer exponents, to equivalent forms.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Creating an algebraic rational expression that can be simplified using properties of exponents and results in a given the solution. • Explaining which properties can be used to simplify an algebraic rational expression. • Justifying the solution from simplifying an algebraic rational expression.	**Sample Task(s)** • Create an algebraic rational expression that requires the use of at least three properties of exponents to simplify and result in the solution x^6z^4. • Write three expressions involving *quotients* that are equivalent to 14^7. • Which definitions or properties would you use to simplify the expression $3x^4y^2 \cdot 4x^3y^{-5}$? Explain your reasoning. • Explain why the expression 0^{-3} is undefined.
(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	
Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Simplifying algebraic rational expressions with numerators and denominators containing monomial bases with integer exponents, to equivalent forms. **Students are consistently able to apply the grade-level concepts and skills above.**	• Simplify the expression. $\left(\frac{2x^2y^3z^{-2}}{4x^{-1}y^2z^2}\right)^{-3}$
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	

Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Evaluating an algebraic expression involving exponents. • Describing and correcting an error made while simplifying an algebraic rational expression.	**Sample Task(s)** • Evaluate the expression $2x^4$ when $x = 3$. • A student simplified the expression $\frac{x^5 \cdot x^3}{x^4}$. His work is shown below. *Describe* and *correct* the error(s) in simplifying the expression. $\frac{x^5 \cdot x^3}{x^4}$ $\frac{x^8}{x^4}$ $= x^{12}$
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.NE.5 Proficiency Scale

Subject: Math	**Course:** Algebra I	**Strand:** Number Systems and Expressions
IAS:	**AI.NE.5:** Add, subtract, and multiply polynomials. Divide polynomials by monomials.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Justifying which operation with polynomials is appropriate for a given real-world scenario. • Simplifying an expression involving multiple operations with polynomials. • Looking for patterns with special products of polynomials and deriving a rule that can be used as a shortcut. • Understanding polynomials are closed under the operations of addition, subtraction, and multiplication with integers.	**Sample Task(s)** • Josie is looking to attach a border to a 6 inch by 8 inch document (shown below). She is wanting to write a polynomial that represents the perimeter of the outside of the border. Josie has decided if she multiplies (2x + 8)(2x + 6), she will find the polynomial representing the total perimeter. Is this true? Justify your reasoning.  • Simplify the expression: $-3x^2(x + 11) - (4x - 5)(3x - 2)$ • Find the product of (3x − 2)(3x + 2). Then, find the product of (7x + 4)(7x − 4). What pattern can be discovered among the products of these binomials? Use this pattern to find the product of (5x − 1)(5x + 1). • What does it mean for polynomials to be closed under the operations of addition, subtraction, and multiplication with integers?
(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	

Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Adding and subtracting polynomials. • Multiplying polynomials. • Dividing polynomials by monomials. **Students are consistently able to apply the grade-level concepts and skills above.**	• Find the sum of the polynomials: $(7x^2 + 2x - 6) + (3x^2 - 11x - 8)$ • Find the difference of the polynomials: $(4x^2 - 3x + 5) - (3x^2 - x - 8)$ • Find the product of the polynomials: $(2x - 5)(3x^2 - x + 7)$ • Divide the polynomials: $\frac{-6x^7 + 12x^5 - 42x^2 - 3x}{-3x}$
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Simplifying an algebraic expression using the distributive property. • Defining key terms required for operations with polynomials. • Describing and correcting an error made while performing operations with polynomials.	**Sample Task(s)** • Simplify the algebraic expression: $3x - 4(2x + 7) + 5$ • Is 6 a polynomial? Explain why or why not. • A student subtracted the polynomials $6x^2 - 5x$ and $2x^2 + 3x - 2$. Her work is shown below. *Describe* and *correct* any error(s) in subtracting the polynomials. $(6x^2 - 5x) - (2x^2 + 3x - 2)$ $6x^2 - 5x - 2x^2 + 3x + 2$ $= 4x^2 - 2x + 2$
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.QE.4 Proficiency Scale

Subject: Math	**Course:** Algebra I	**Strand:** Quadratic & Exponential Equations & Functions
IAS:	**AI.QE.4:** Solve quadratic equations in one variable by inspection (e.g., for x^2 = 49), finding square roots, using the quadratic formula, and factoring, as appropriate to the initial form of the equation.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Justifying the method of choice for solving a quadratic equation. • Identifying an error made in the process of solving a quadratic equation, including complex numbers. • Correcting an error made in the process of solving a quadratic equation, including complex numbers.	**Sample Task(s)** • Tell what method you would use to solve the quadratic equation. Justify your reasoning. ◦ $3x^2 + 13x = 11$ ◦ $4x^2 - 25 = 0$ ◦ $2x^2 + 9x - 5 = 0$ • A student solved the equation $7x^2 - 5x + 1 = 0$ using the quadratic formula. His work is shown below. *Describe* and *correct* the error in solving the equation. $$x = \frac{5 \pm \sqrt{(-5)^2 - 4(7)(1)}}{2(7)}$$ $$x = \frac{5 \pm \sqrt{-3}}{14}$$ *"Because the discriminant has a negative value, there are no solutions to this quadratic equation."* • Ashley solved the equation $-2(x + 4)^2 - 1 = -25$ using square roots. Her work is shown below. Describe and correct the error in solving the equation. $$-2(x + 4)^2 - 1 = -25$$ $$-2(x + 4)^2 = -24$$ $$(x + 4)^2 = 12$$ $$x^2 = 8$$ $$x = \pm 2\sqrt{2}$$ $$x \approx -2.83, 2.83$$

(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	
Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Solving quadratic equations in one variable by inspection. • Solving quadratic equations in one variable by finding square roots. • Solving quadratic equations in one variable using the quadratic formula. • Solving quadratic equations in one variable by factoring. **Students are consistently able to apply the grade-level concepts and skills above.**	• Solve the quadratic equation by inspection: $x^2 = 64$ • Solve the quadratic equation by finding square roots: $3(x - 1)^2 = 30$ • Solve the quadratic equation using the quadratic formula: $5x^2 - 4x - 3 = 0$ • Solve the quadratic equation by factoring: $15x^2 + 10 = 31x$
(2.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Finding the number of real solutions to a quadratic equation using the discriminant. • Evaluating an algebraic expression. • Defining key terms required to solve quadratic equations.	**Sample Task(s)** • Tell whether there are two real solutions, one real solution, or no real solutions to the quadratic equation $25x^2 - 16x = 0$. • Evaluate the expression $x^2 - x - 6$ when $x = -3$. • What is the quadratic formula? When do we use it?
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

AI.DS.1 Proficiency Scale

Subject: Math	**Course:** Algebra I	**Strand:** Data Analysis and Statistics
IAS:	**AI.DS.1:** Understand statistics as a process for making inferences about a population based on a random sample from that population. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	
Mastery (4.0)	**Students demonstrate a deep understanding by consistently extending work beyond the Proficiency Level by:** • Conducting an experiment of a current applicable topic and using the data to answer questions concerning bias and misconception. • Extending understanding of sample size and population to utilize the margin of error formula.	**Sample Task(s)** • A stratified random sample of a population is used for a survey that contains unbiased questions. ◦ Explain how it is possible for the survey to be biased. ◦ Describe a situation in which this might occur. • Find a misleading graph from a newspaper, a magazine, or online news source. ◦ Describe how the graph is misleading. ◦ Redraw the graph so that it is not misleading. ◦ Explain how redrawing the graph changes the impression given by the graph. ◦ Assuming the misleading aspect of the graph is intentional, why might it have been made that way? • In a survey of 2,000 voters, 45% said they planned to vote for Candidate A. What is the margin of error for the survey?
(3.5)	*Students have consistently met Proficiency Level requirements but occasionally demonstrate the ability to successfully work beyond.*	

Proficiency (3.0)	**Students demonstrate Proficiency on the grade-level standard by:** • Understanding statistics as a process for making inferences about a population based on a random sample from that population. • Recognizing the purpose of sample surveys, experiments, and observational studies. • Recognizing the differences of sample surveys, experiments, and observational studies. • Explaining how randomization applies to sample surveys, experiments, and observational studies. **Students are consistently able to apply the grade-level concepts and skills above.**	• To determine if the type of music played while taking a quiz has a relationship to results, sixteen students were randomly assigned to either a room softly playing classical music or a room softly playing rap music. The results on the quiz were as follows: Classical: 74, 83, 77, 77, 84, 82, 90, 89 Rap: 77, 80, 78, 74, 69, 72, 78, 69 ◦ Which group performed better? Justify your answer. • Mrs. Goodmore wants to know if doing homework actually helps students do better on their unit exams. Describe how Mrs. Goodmore could carry out an experiment to determine if homework helps test scores. Explain how you will use randomization in your design and how you will use a control. • Students in a high school mathematics class decided that their term project would be a study of the strictness of the parents or guardians of students in the school. Their goal was to estimate the proportion of students in the school who thought of their parents or guardians as strict. They do not have time to interview all 1,000 students in the school, so they plan to obtain data from a sample of students. ◦ Describe the parameter of interest and a statistic the students could use to estimate the parameter. ◦ Is the best design for this study a sample survey, an experiment, or an observational study? Explain your reasoning. *(continued on next page)*

		◦ The students quickly realized that, as there is no definition of strict, they could not simply ask a student, "Are your parents or guardians strict?" Write three questions that could provide objective data related to strictness. ◦ Describe an appropriate method for obtaining a sample of 100 students, based on your answer in part (a) above.
(2.5)	*Students have demonstrated an understanding of the concepts and skills in the Foundational Level, as well as some success on Proficiency concepts and skills.*	
Foundational (2.0)	**Students demonstrate success on the following Foundational concepts and skills by:** • Identifying a population. • Identifying a sampling method. • Defining key terms required for distinguishing sampling methods.	**Sample Task(s)** • Owners of a computer store survey customers to see whether they should expand their game selection. They survey customers in the game aisle. Identify the population and classify the sampling method. • Describe the difference between an unbiased sample and a biased sample. • What methods can be used for selecting a sample?
(1.5)	*Students have independently demonstrated some success on the Foundational concepts and skills.*	
Pre-Foundational (1.0)	**Students demonstrate some success on the Foundational concepts and skills but require support to do so.**	
(0.0)	**There is no evidence of success on the Foundational concepts and skills, even with support.**	

Grade Level: **Date:** **Unit Completed:** **Next Unit:**

After each unit, fill out this form. Reuse and print these pages, or we suggest using our Google Sheets version or Google Doc version.

Looking Back

Curriculum

• What were the **strengths** of this unit? (i.e. standard organization/sequence, unit length, resources, etc.)	• What do we want to **change** about this unit for next year? (i.e. standard organization/sequence, unit length, resources, etc.)

Instruction

• What **instructional strategies** had the biggest impact during this unit?	• What **learning activities** had the biggest impact during this unit?

Assessment Data

• What did **student data** tell us about student learning in this unit?	• What **Tier II supports** will we need to provide after this unit? When/how will those be provided?

Looking Ahead

Preparation

- What materials/resources need to be **created/gathered** in preparation for this unit?

Curriculum

- How do we want to **sequence/organize** the standards in this unit?
- How will we **prepare** students for this unit? (i.e. foundational skill review, build background knowledge, etc.)
- What existing **learning gaps** do we anticipate needing to address, and what **differentiation/scaffolds** can be used?

Instruction

- What **instructional strategies** will we use for each standard?
- What **learning activities** will we use?

Assessment Data

- What **assessments** will we use? Are the assessments ready?
- What priority standards will we **review** during this unit?

Status Check

Are we on track to teach all grade-level standards?

◯ **Yes** ◯ **No, we need to make the following modifications:**

- What support do you need from administrators/coaches at this point?

- Other comments:

Employability Skills Standards

SEL Competencies are linked below within each Employability Skills Standard.

Mindset	Work Ethic	Social & Emotional Skills	Learning Strategies
Lifelong Learning Mindset (K-2) B,C Mindset (3-5) C Mindset (6-8) C Mindset (9-10) C Mindset (11-12) A	**Self-Discipline** Regulation (K-2) A Collaboration (3-5) C Regulation (6-8) C Collaboration (6-8) C Regulation (9-10) Collaboration (11-12) B	**Regulation** Regulation (K-2) C Regulation (3-5) C Regulation (6-8) B Regulation (9-10) C Regulation (11-12) C	**Effective Communication** Collaboration (K-2) A Collaboration (3-5) A Collaboration (6-8) A Collaboration (9-10) A Collaboration (11-12) A
Self-Confidence Insight (K-2) C Insight (3-5) C Insight (6-8) C Insight (9-10) C Insight (11-12) C	**Independence** Insight (K-2) C Insight (3-5) C Insight (6-8) C Insight (9-10) C Insight (11-12) C	**Connection** Connection (K-2) A Connection (3-5) A Connection (6-8) A Connection (9-10) A,B Connection (11-12) A,B	**Aptitude Awareness** Insight (K-2) B Insight (3-5) B Insight (6-8) B Insight (11-12) B Insight (11-12) B
	Perseverance Mindset (K-2) A Mindset (3-5) A Mindset (6-8) A Mindset (9-10) A Mindset (11-12) A	**Collaboration** Collaboration (K-2) A Collaboration (3-5) B Collaboration (6-8) A Collaboration (9-10) A Collaboration (11-12) A Collaboration (9-10) C Collaboration (11-12) C	**Decision Making** Critical-Thinking (K-2) A,B Critical-Thinking (3-5) A,B Critical-Thinking (6-8) B Critical-Thinking (9-10) B,C Critical-Thinking (11-12) B,C

	Adaptability Sensory-Motor Int. (K-2) B Sensory-Motor Int. (3-5) B Sensory-Motor Int. (6-8) B Sensory-Motor Int. (9-10) Sensory-Motor Int. (11-12) B		**Attention to Detail** Regulation (K-2) C Insight (3-5) C
	Time Management & Organization		**Initiative** Insight (K-2) C Insight (3-5) C Insight (6-8) C Regulation (6-8) C
	Integrity		**Problem Solving** Critical-Thinking (K-2) A Critical-Thinking (3-5) A Critical-Thinking (6-8) A Critical-Thinking (9-10) A Critical-Thinking (11-12) A
	Professionalism		
Indiana WORKFORCE Development – Employability Skills Benchmark			

Schedule

1st Nine Week (Mindsets & Social & Emotional Skills)
Week 1-2: LIFELONG LEARNING: ***Demonstrate willingness to work and learn, and continually apply new knowledge.*** • Students practice flexible and innovative thinking. (K-2)B • Students accept constructive feedback. (K-10)C • Students demonstrate a willingness to learn, especially when faced with challenges or following a failure. (Grades 11-12)A
Week 3-4: SELF-CONFIDENCE: ***Possess belief in own ability to succeed and assert self when necessary.*** • Students demonstrate self-efficacy. (K-12)C
Week 5-6: REGULATION: ***Recognize and manage one's emotions.*** • Students practice personal responsibility. (K-5 & 9-12)C • Students recognize life stressors and have strategies to manage them. (Grades 6-8)B
Week 7-8: CONNECTION: ***Demonstrate the ability to network with others through social awareness and cultural sensitivity.*** • Students treat others fairly and respectfully, is able to see multiple perspectives and is open-minded. (K-12)A • Students demonstrate care and concern for others. (Grades 9-12)B
Week 9: COLLABORATION: ***Work well with others in a team.*** • Students demonstrate communication skills. (K-12)A • Students understand teamwork and works with others. (Grades 3-5)B • Students apply conflict management skills. (Grades 9-12)C

2nd Nine Week (Learning Strategies)

Week 1: COLLABORATION:

Work well with others in a team.

*Same as Week 9

Week 2-3: EFFECTIVE COMMUNICATION:

Apply skills to clearly, effectively, and convincingly express ideas and messages to others appropriate to the environment.

- Students demonstrate communication skills. (K-12)A

Week 4-5: APTITUDE AWARENESS:

Identify and communicate individual interests and skills that align related coursework and experiences to potential career paths and to in-demand occupations.

- Students recognize personal strengths. (K-2)

Week 6-7: DECISION MAKING:

Utilize critical thinking skills and perspectives of others to make informed decisions based on options, rewards, risks, limits, and goals.

- Students demonstrate an understanding of metacognition. (K-5)A
- Students understand the decision-making process. (K-12)B
- Students demonstrate an understanding of metacognition. (Grades 3-5)A
- Students analyze, synthesize, & evaluate the thinking process. (Grades 11-12)B,C

Week 8-9: ATTENTION TO DETAIL:

Achieve thoroughness and accuracy when accomplishing a task.

- Students practice personal responsibility. (K-2)C
- Students demonstrate self-efficacy. (Grades 3-5)C

3rd Nine Week (Learning Strategies & Work Ethic)
Week 1-2: INITIATIVE: ***Apply self-motivation, and self-direction to work and learning.*** • Students demonstrate self-efficacy. (K-8)C • Students practice personal responsibility. (Grade 6-8)C
Week 5-6: SELF-DISCIPLINE: ***Demonstrate self-control and behave in accordance with rules and minimal direction.*** • Students demonstrate self-control. (K-2 & 9-10)A • Students apply conflict management skills. (Grades 3-5)C • Students practice personal responsibility. (Grades 6-8)C • Students apply conflict management skills. (Grades 6-8)C • Students understand teamwork and works with others. (Grades 11-12)B
Week 7-8: INDEPENDENCE: ***Successfully carry out expectations with minimal supervision.*** • Students demonstrate self-efficacy. (K-12)C
Week 9: PERSEVERANCE: ***Demonstrate endurance, and capacity to complete tasks.*** • Students demonstrate a willingness to learn, especially when faced with challenges or following a failure. (K-12)A

4th Nine Week (Work Ethic)
Week 1: PERSEVERANCE: ***Demonstrate endurance, and capacity to complete tasks.*** *Same as Week 9
Week 2-3: ADAPTABILITY: ***Manage transitions and adjust to changing situations and responsibilities.*** • Students demonstrate an understanding of body awareness and sensations in the body.
Week 4-5: TIME MANAGEMENT & ORGANIZATION: ***Plan and organize long and short-term goals while understanding how to balance school, home, and community activities.*** *No SEL Competencies
Week 6-7: INTEGRITY: ***Act in a trustworthy and honest manner.*** *No SEL Competencies
Week 8-9: PROFESSIONALISM: ***Demonstrate skills and behaviors appropriate for school and work environments.*** *No SEL Competencies

Grade Level Employability Skills Standards	
Kindergarten – 2nd Grade	K-2 Skills Standards
Grades 3-5	Grade 3-5 Skills Standards
Grades 6-8	Grades 6-8 Skills Standards
Grades 9-10	Grades 9-10 Skills Standards
Grades 11-12	Grades 11-12 Skills Standards

Employability Skills Standards Competencies
Sample Lesson Plans
Integrating Employability Skills: A Framework for All Educators
IDOE Employability Skills Standards Poster
Employability Skills Standards Implementation Guide

PK-12 IDOE Social & Emotional Learning Competencies

PK-12 SEL Competencies (Grade Level Indicators & Strategies)
IDOE SEL Competencies K-12 Lesson Plans
IDOE SEL TOOLKIT pg. 28-69

Additional Resources

Transforming Education Growth Mindset Tool Kit (K-12)
Neuroplasticity Video (Grades 6-12)
Ned the Neuron – Plasticity (K-5)
Class DoJo Growth Mindset Video (K-5)
Carol Dweck on the Power of Yet (Teacher Video)
Growth Mindset Video (Grades 6-12)
Teaching a Growth Mindset (Teacher Resource)
Edutopia's Resources for Teaching Growth Mindset
Life-Skills Games Guide (K-6)
PBS Media Videos
9 Awareness Classroom Activities that Teach Job Readiness Skills
Free High School Life Skills Activities (Teacher Pay Teacher)
10 Free Financial Literacy Games for High School Students