

Course Title: Algebra I

Board Approval Date: January 17, 2019

Credit / Hours: 1.0

Course Description:

Algebra 1 focuses on mastery of the PA Core Standards for Mathematics. Algebra 1 aims to improve students abilities in the areas of real numbers and expressions, linear equations, linear inequalities, functions, coordinate geometry, and data analysis. The focus is on simplifying polynomials and expressions, linear equations and inequalities, analyzing and interpreting functions, interpreting scatter plots, and describing sets of data and probability.

Learning Activities / Modes of Assessment:

ALEKS Pre - tests Teacher Observation Kahoot, Quizizz and Quizlet Notability Bell Ringers Exit Tickets Collaborative Projects Small Group Whole Group Partner Work Whiteboard Practice Review Games Desmos Activities GeoGebra Think-Pair-Share	Stations Scavenger Hunts Nearpod Edpuzzles Flipgrid CDTS Multiple Choice Keystone Questions Constructed Response Questions Math Libs Task Cards Schoology Assignments Error Analysis Self-checking with answer key Word Problems- real world application Quizzes Tests
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Instructional Resources:

ALEKS

Desmos

Keystone Coach Book (Red and Blue)

SAS

Online Practice Tools

Khan Academy

IXL

Teachers Pay Teachers

Teacher created resources

Kuta Software

Instructional Multimedia Tools

Curriculum: Math
Course: Grade 9 Algebra I

Unit/Lesson: Foundations of Algebra

Know:	Understand:	Do:
<p>A1.1.1.1 Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).</p> <p>A1.1.1.3 Use exponents, roots, and/or absolute values to solve problems.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Numbers can be represented in equivalent forms.• Expressions can be simplified• Numbers belong to different groups• Words or phrases can be represented by numbers and variables• Properties are used to simplify expressions• All representations of numbers have a numerical value in a common form	<p>A1.1.1.1.1 Compare and/or order any real numbers. Note: Rational and irrational may be mixed.</p> <p>A1.1.1.3.1 Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems. <i>Note: Exponents should be integers from -10 to 10.</i></p>

Unit/Lesson: Multi-Step Equations and Inequalities

Know:	Understand:	Do:
<p>A1.1.2.1 Write, solve, and/or graph linear equations using various methods.</p> <p>A1.1.3.1 Write, solve, and/or graph linear inequalities using various methods.</p> <p>A1.1.1.4 Use estimation strategies in problem-solving situations.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Inequalities can have a range of solutions • Equations have various solution types • Properties of equality are used to solve equations • An inequality solution can be represented visually on a number line • A real world scenario can be represented and solved using an equation 	<p>A1.1.2.1.1 Write, solve, and/or apply a linear equation (including problem situations).</p> <p>A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation-solving process.</p> <p>A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation.</p> <p>A1.1.3.1.1 Write and/ or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities)</p> <p>A1.1.3.1.2 Identify or graph the solution set to a linear inequality on a number line</p> <p>A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation</p> <p>A1.1.1.4.1 Use estimation to solve problems</p>

Unit/Lesson: Functions

Know:	Understand:	Do:
<p>A1.2.1.1 Analyze and/or use patterns or relations.</p> <p>A1.2.1.2 Interpret and/or use linear functions and their equations, graphs, or tables.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Numbers can be represented in equivalent forms.• Expressions can be simplified• Numbers belong to different groups• Words or phrases can be represented by numbers and variables• Properties are used to simplify expressions• All representations of numbers have a numerical value in a common form	<p>A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.</p> <p>A1.2.1.1.2 Determine whether a relation is a function, given a set of points or a graph.</p> <p>A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).</p> <p>A1.2.1.2.1 Create, interpret, and/or use the equation, graph, or table of a linear function.</p> <p>A1.2.1.2.2 Translate from one representation of a linear function to another (<i>i.e.</i>, <i>graph</i>, <i>table</i>, and <i>equation</i>).</p>

Unit/Lesson: Coordinate Geometry

Know:	Understand:	Do:
<p>A1.2.2.1 Describe, compute, and/or use the rate of change (slope) of a line.</p> <p>A1.1.2.1 Write, solve, and/or graph linear equations using various methods.</p> <p>A1.2.2.1 Describe, compute, and/or use the rate of change (slope) of a line.</p> <p>A1.2.2.2 Analyze and/or interpret data on a scatter plot.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • Linear Equations can be represented in multiple forms. • There are different types of slope. • Parallel and perpendicular lines are related through slope. • A line of best fit is a linear equation that best represents a scatter plot. 	<p>A1.2.2.1.1 Identify, describe, and/or use constant rates of change.</p> <p>A1.2.2.1.3 Write or identify a linear equation when given the graph of the line, two points on the line, or the slope and a point on the line.</p> <p>A1.2.2.1.4 Determine the slope and/or y-intercept represented by a linear equation or graph.</p> <p>A1.1.2.1.1 – Write, solve and/ or apply a linear equation (including problem situations).</p> <p>A1.1.2.1.3 – Interpret solutions to problems in the context of the problem situation (linear equations only).</p> <p>A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems.</p> <p>A1.2.2.2.1 Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.</p>

Unit/Lesson: Systems of Equations and Inequalities

Know:	Understand:	Do:
<p>A1.1.2.2 Write, solve, and/or graph systems of linear equations using various methods.</p> <p>A1.1.3.2 Write, solve, and/or graph systems of linear inequalities using various methods.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> • There are different methods to solving systems of equations. • There are one, infinite, or no solutions to a system of equations. • Graphs will look different depending on the solution. • Graphs of linear inequalities differ based on the range of solutions • You can apply systems of equations and inequalities to real world situations 	<p>A1.1.2.2.1 - Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination.</p> <p>A1.1.2.2.2 - Interpret solutions to problems in the context of the problem situation</p> <p>A1.1.3.2.1 - Write and/or solve a system of linear inequalities using graphing</p> <p>A1.1.3.2.2 - Interpret solutions to problems in the context of the problem situation</p>

Unit/Lesson: Polynomials and Factoring

Know:	Understand:	Do:
<p>A1.1.1.5 Simplify expressions involving polynomials.</p> <p>A1.1.1.2 Apply number theory concepts to show relationships between real numbers in problem-solving settings.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• You must always look for a gcd first when factoring• There are different ways to factor based on the structure of the polynomials• Polynomials and rational expressions can be simplified using operations• Factoring can be used to simplify rational expressions• Multiplying polynomials and factoring are opposites	<p>A1.1.1.5.1 - Add, subtract, and/or multiply polynomial expressions (express answers in simplest form)</p> <p>A1.1.1.5.2 - Factor algebraic expressions, including difference of squares and trinomials</p> <p>A1.1.1.5.3 - Simplify/reduce a rational algebraic expression</p> <p>A1.1.1.2.1 - Find the greatest common factor and/or the least common multiple for sets of monomials.</p>

Unit/Lesson: Exponents and Radicals

Know:	Understand:	Do:
<p>A1.1.1.1 Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, and exponents).</p> <p>A1.1.1.3 Use exponents, roots, and/or absolute values to solve problems.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Simplified answers should not contain negative or zero exponents• Expressions are not fully simplified until there is one of each variable• Radicals are not fully simplified until nothing else can be factored out from the radical	<p>A1.1.1.1.2 - Simplify square roots</p> <p>A1.1.1.3.1 - Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems</p>

Unit/Lesson: Data Analysis

Know:	Understand:	Do:
<p>A1.2.3.1 Use measures of dispersion to describe a set of data.</p> <p>A1.2.3.2 Use data displays in problem-solving settings and/or to make predictions.</p> <p>A1.2.3.3 Apply probability to practical situations.</p>	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none">• Depending on the data, different central tendencies are more representative• A box and whisker plot separates the data into four equal portions• Probability can be represented as a decimal, fraction or percent• You can find missing information from different representations of graphs• You can predict information from different representations of graphs	<p>A1.2.3.1.1 Calculate and/or interpret the range, quartiles, and interquartile range of data.</p> <p>A1.2.3.2.1 Estimate or calculate to make predictions based on a circle, line, bar graph, measure of central tendency, or other representation.</p> <p>A1.2.3.2.2 Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).</p> <p>A1.2.3.2.3 Make predictions using the equations or graphs of best-fit lines of scatter plots.</p> <p>A1.2.3.3.1 Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent.</p>

Algebra I Pacing Guide

Course: Algebra I

Course Unit (Topic) Periods)	Length of Instruction (Class
Foundations of Algebra	11 Days
Multi-Step Equations and Inequalities	12 Days
Functions	9 Days
Linear Equations	11 Days
Systems of Equations and Inequalities	10 Days
Polynomials and Factoring	10 Days
Exponents, Rational and Radical Expressions	13 Days
Data Analysis	9 Days
Keystone Review	
Total	85 Days