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ALGEBRA 1

Mathematics

Curriculum Guide

Developed: June 2016

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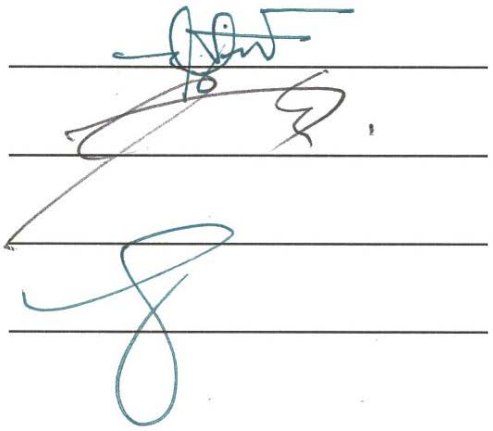

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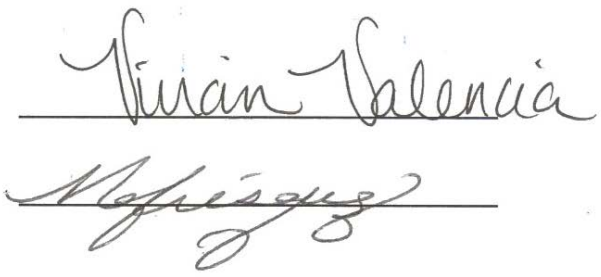

Mathematics Resources

Adopted Curriculum

Grade Band	Resource	District Contact
9-12 *2013-2018*	**College Preparatory Math (CPM)** **Website:** http://textbooks.cpm.org	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent Nancy Suazo, EVHS Department Chair

Mathematics Resources

Supplemental Curriculum Resources

Grade Band	Resource	District Contact:
9-12 *2015-2020*	***Pearson Algebra 1*** ***www.kutasoftware.com*** ***www.ixl.com*** ***www.khanacademy.com*** ***www.teachertube.com*** ***triumph learning*** ***accelerated math*** ***www.insidemathematics.org*** ***www.illustrativemathematics.org*** **Website: https://learn.education2020.com**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent Nancy Suazo, EVHS Department Chair Sandra Roney, Edgenuity Administrator Larry DeAguerro, Federal Programs (Title I) Deirdra Montoya, Special Education Director TBA, Assessment & RtI Facilitator

Mathematics Resources

Adopted Curriculum

Grade Band	Resource	District Contact:
9-12	***Core Assessments*** ***College Preparatory Math (CPM)***	**Nancy Suazo, Math Department Chair**
9-12	***Supplemental Assessments*** ***Common Core Coach Algebra 1***	**Nancy Suazo, Math Department Chair**
2-12	**STAR Math**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator
3-11	**PARCC**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator
7-12	**End of Course Exams (EoC)**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator

Grade Band	Resource	District Contact
Pre K *2013-2018*	**Creative Classroom** **Website:**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Pre K Coordinator
K -6 *2013-2018*	  **Website:** www.pearsonsuccessnet.com	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach
7-8 *2013-2018*	**College Preparatory Math (CPM)** **CPM teacher log in:**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent Robert Quiñonez, CFVMS Assistant

Mathematics Resources

Adopted Curriculum

	http://textbooks.cpm.org/?238090954324249223 **CPM student log in:** http://en8467.textbooks.cpm.org/?409553627727330301	Principal
9-12 *2013-2018*	**College Preparatory Math (CPM)**  **CPM teacher log in:** http://textbooks.cpm.org/?238090954324249223 **CPM student log in:** http://en8467.textbooks.cpm.org/?409553627727330301	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent Nancy Suazo, EVHS Department Chair

Mathematics Resources

Supplemental Curriculum Resources

Grade Band	Resource	District Contact:
Pre K *2016-2021*	***Insert Resource*** **Website:** Insert ***Insert Resource*** **Website:** Insert	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Pre K Coordinator Larry DeAguerro, Federal Programs (Title I) Deirdra Montoya, Special Education Director TBA, Assessment & RtI Facilitator
K -6 *2016-2021*	***Insert Resource*** **Website:** Insert ***Insert Resource*** **Website:** Insert	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach Larry DeAguerro, Federal Programs (Title I) Deirdra Montoya, Special Education Director TBA, Assessment & RtI Facilitator
7-8 *2016-2021*	***Insert Resource*** **Website:** Insert Edgenuity **Website:** Insert	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent Robert Quiñonez, CFVMS Assistant Principal Insert Name, Edgenuity Administrator Larry DeAguerro, Federal Programs (Title I) Deirdra Montoya, Special Education Director TBA, Assessment & RtI Facilitator
9-12 *2015-2020*	***Insert Resource*** **Website:** Edgenuity **Website:** Insert	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent Insert Name, EVHS Department Chair Insert Name, Edgenuity Administrator Larry DeAguerro, Federal Programs (Title I) Deirdra Montoya, Special Education Director TBA, Assessment & RtI Facilitator

Mathematics Resources

Supplemental Curriculum Assessments

Grade Band	Resource	District Contact:
Pre K *2016-2021*	***Insert Resource*** **Website:** Insert **PreK Observation & Portfolios**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Pre K Coordinator **Assessment Contact:** TBA, Assessment & RtI Facilitator
K-1	**Envisions:** **Topic Book Assessments** **Topic Mat Assessments** **Renaissance Learning:** **STAR EARLY LITERACY (Numeracy)** **https://hosted39.renlearn.com/258790/default.aspx**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator
2-12	**Envisions:** **Topic Book Assessments** **Topic Mat Assessments (2nd)** **Renaissance Learning:** **STARMath** **https://hosted39.renlearn.com/258790/default.aspx**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator
3-11	**PARCC**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach

		Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator
7-12	**End of Course Exams (EoC)** NMPED Public Education Department **College Prepatory Math (CPM)** CPM **CPM teacher log in:** **http://textbooks.cpm.org/?238090954324249223** **CPM student log in:** **http://en8467.textbooks.cpm.org/?409553627727330301**	**Office of Curriculum, Instruction & Assessment** Myra L. Martinez, Associate Superintendent MaryEllen Fresquez, Instructional Coach Vivian Valencia, Instructional Coach **Assessment Contact:** TBA, Assessment & RtI Facilitator

At a Glance Pacing Guide

ALGEBRA I

UNITS	STANDARD CLUSTERS	COMMON CORE STANDARDS	Resources (Core/Supplement)	Assessment (Formative & Summative)
UNIT 1 Relationships Between Quantities and Reasoning with Equations 8/17-9/23	**1.** Reason quantitatively and use units to solve problems. 2. Interpret the structure of expression. 3. Create equations that describe numbers or relationships. 4. Understand solving equations as a process of reasoning and explain the reasoning. 5. Solve equations and inequalities in one variable.	CC.9-12.N.RN.1 Extend the properties of exponents to rational exponents. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 5^(1/3) to be the cube root of 5 because we want [5^(1/3)]^3 = 5^[(1/3) x 3] to hold, so [5^(1/3)]^3 must equal 5. CC.9-12.N.RN.2 Extend the properties of exponents to rational exponents. Rewrite expressions involving radicals and rational exponents using the properties of exponents. CC.9-12.N.RN.3 Use properties of rational and irrational numbers. Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.* CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.* CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	Core: Adopted College Preparatory Math (CPM) Algebra 1 Chapter 1 pages 1-37 Supplement Pearson Algebra 1 www.kutasoftware.com www.ixl.com www.khanacademy.com www.teachertube.com triumph learning accelerated math www.insidemathematics.org www.illustrativemathematics.org	Formative Worksheet # 1 Summative Common Core Coach Algebra 1 Assessments
UNIT 2 Expressions and Equations 9/26-10/31	1. Interpret the structure of expressions. 2. Write expressions in equivalent forms to solve problems. 3. Perform arithmetic operations on polynomials. 4. Create equations that describe numbers or relationships. 5. Solve equations and inequalities in one variable. 6. Solve systems of equations.	CC.9-12.A.SSE.1 Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context.* CC.9-12.A.SSE.1a Interpret parts of an expression, such as terms, factors, and coefficients.* CC.9-12.A.SSE.1b Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)^n as the product of P and a factor not depending on P.* CC.9-12.A.SSE.2 Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it. For example, see x^4 – y^4 as (x^2)^2 – (y^2)^2, thus recognizing it as a difference of squares that can be factored as (x^2 – y^2)(x^2 + y^2). CC.9-12.A.SSE.3 Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.* CC.9-12.A.SSE.3a Factor a quadratic expression to reveal the zeros	Core: Adopted College Preparatory Math (CPM) Algebra 1 Appendix Pages 245-282 Supplement Pearson Algebra 1 www.kutasoftware.com www.ixl.com www.khanacademy.com www.teachertube.com triumph learning accelerated math	Formative Worksheet # 2 Summative Common Core Coach Algebra 1 Assessments

		of the function it defines.* CC.9-12.A.SSE.3b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.* CC.9-12.A.SSE.3c Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as [1.15^(1/12)]^(12t) ≈ 1.012^(12t) to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.* CC.9-12.A.SSE.4 Write expressions in equivalent forms to solve problems. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.* CC.9-12.A.APR.1 Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*	www.insidemathematics.org www.illustrativemathematics.org	
UNIT 3 Linear and Exponential Relationships 11/1-2/3	1. Extend the properties of exponents to rational exponents. 2. Solve systems of equations. 3. Represent and solve equations and inequalities graphically. 4. Understand the concept of a function and use function notation. 5. Interpret functions that arise in applications in terms of a context. 6. Analyze functions using different representations. 7. Build a function that models a relationship between two quantities. 8. Build new functions from existing functions. 9. Construct and compare linear, quadratic and exponential models and solve problems. 10. Interpret expressions for functions in terms of the situation they model.	CC.9-12.A.CED.2 Create equations that describe numbers or relationship. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.* CC.9-12.A.CED.3 Create equations that describe numbers or relationship. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* CC.9-12.A.CED.4 Create equations that describe numbers or relationship. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.* CC.9-12.A.REI.1 Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. CC.9-12.A.REI.2 Understand solving equations as a process of reasoning and explain the reasoning. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. CC.9-12.A.REI.3 Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. CC.9-12.A.REI.5 Solve systems of equations. Prove 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	Core: Adopted College Preparatory Math (CPM) Algebra 1 Chapter 2 pages 43-86 Chapter 7 Pages 405-452 Supplement Pearson Algebra 1 www.kutasoftware.com www.ixl.com www.khanacademy.com www.teachertube.com triumph learning accelerated math www.insidemathematics.org www.illustrativemathematics.org	Formative Activities: www.illustrativemathematics.org Summative Common Core Coach Algebra 1 Assessments

		system with the same solutions. CC.9-12.A.REI.6 Solve systems of equations. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. CC.9-12.A.REI.10 Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). CC.9-12.A.REI.12 Represent and solve equations and inequalities graphically. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. CC.9-12.F.IF.1 Understand the concept of a function and use function notation. 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. 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. The graph off is the graph of the equation y = f(x). CC.9-12.F.IF.2 Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. CC.9-12.F.IF.3 Understand the concept of a function and use function notation. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1 (n is greater than or equal to 1). CC.9-12.F.BF.1 Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities.* CC.9-12.F.BF.1a Determine an explicit expression, a recursive process, or steps for calculation from a context. CC.9-12.F.BF.1b Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model. CC.9-12.F.BF.1c (+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time. CC.9-12.F.BF.2 Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.* CC.9-12.F.BF.3 Build new functions from existing functions. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the		

		value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. CC.9-12.F.LE.1 Construct and compare linear, quadratic, and exponential models and solve problems. Distinguish between situations that can be modeled with linear functions and with exponential functions.* CC.9-12.F.LE.1a Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.* CC.9-12.F.LE.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.* CC.9-12.F.LE.1c Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.* CC.9-12.F.LE.2 Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).* CC.9-12.F.LE.3 Construct and compare linear, quadratic, and exponential models and solve problems. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.*		
UNIT 4 Quadratic Functions and Modeling 2/6-4/21	1. Use properties of rational and irrational numbers. 2. Interpret functions that arise in applications in terms of a context. 3. Analyze functions using different representations. 4. Build a function that models a relationship between two quantities. 5. Build new functions from existing functions. 6. Construct and compare linear, quadratic, and exponential models and solve problems. 7. Understand the relationship between zeros and factors of polynomials.	CC.9-12.A.APR.2 Understand the relationship between zeroes and factors of polynomial. Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x). CC.9-12.A.APR.3 Understand the relationship between zeroes and factors of polynomials. Identify zeroes of polynomials when suitable factorizations are available, and use the zeroes to construct a rough graph of the function defined by the polynomial. CC.9-12.A.APR.4 Use polynomial identities to solve problems. Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2 can be used to generate Pythagorean triples. CC.9-12.A.APR.5 (+) Use polynomial identities to solve problems. Know and apply that the Binomial Theorem gives the expansion of (x + y)^n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.) CC.9-12.A.APR.6 Rewrite rational expressions. Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system. CC.9-12.A.APR.7 (+) Rewrite rational expressions. Understand that rational expressions form a system analogous to the rational	Core: Adopted College Preparatory Math (CPM) Algebra 1 Chapter 8 Pages 463-506 Chapter 9 Pages 513-558 Supplement Pearson Algebra 1 www.kutasoftware.com www.ixl.com www.khanacademy.com www.teachertube.com triumph learning accelerated math www.insidemathematics.org www.illustrativemathematiics.org	Formative Activities: Worksheet- Unit 4 Summative Common Core Coach Algebra 1 Assessments

		numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions. CC.9-12.A.REI.4 Solve equations and inequalities in one variable. Solve quadratic equations in one variable. CC.9-12.A.REI.4a Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)^2 = q that has the same solutions. Derive the quadratic formula from this form. CC.9-12.A.REI.4b Solve quadratic equations by inspection (e.g., for x^2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b. CC.9-12.A.REI.7 Solve systems of equations. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x^2 + y^2 = 3. CC.9-12.F.IF.4 Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.* CC.9-12.F.IF.6 Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.* CC.9-12.F.IF.7 Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.* CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.* end behavior.* CC.9-12.F.IF.8 Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. CC.9-12.F.IF.8a Use the process of factoring and completing the square in a quadratic function to show zeroes, extreme values, and symmetry of the graph, and interpret these in terms of a context. CC.9-12.F.IF.9 Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal		

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ALGEBRA I

		descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.		
UNIT 5 Descriptive Statistics 4/24-5/19	1. Summarize, represent, and interpret data on a single count or measurement variable. 2, Summarize, represent, and interpret data on two categorical and quantitative variables. 3. Interpret linear models.	CC.9-12.S.ID.1 Summarize, represent, and interpret data on a single count or measurement variable. Represent data with plots on the real number line (dot plots, histograms, and box plots).* CC.9-12.S.ID.2 Summarize, represent, and interpret data on a single count or measurement variable. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.* CC.9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.* CC.9-12.S.ID.7 Interpret linear models. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*	Core: Adopted College Preparatory Math (CPM) Algebra 1 Chapter 11 Pages 631-652 Supplement Pearson Algebra 1 www.kutasoftware.com www.ixl.com www.khanacademy.com www.teachertube.com triumph learning accelerated math www.insidemathematics.org www.illustrativemathematics.org	Formative Activities: www.illustrativemathematics.org Summative Common Core Coach Algebra 1 Assessments

New Mexico Public Education Department

Assessment Blueprint

Mathematics: Algebra I

End-of-Course (EoC) Exam

Version 003

Spring 2015

Purpose Statement

Mathematics: Algebra I

The Algebra I End-of-Course assessment is designed to measure student proficiency of the Common Core State Standards (CCSS) in Mathematics pertaining to Algebra I. This course-level assessment is provided to all students who have completed Algebra I, Algebra I Eighth Grade (STARS codes 2031 or 2028) or related courses. Intended as a final exam for the course, this is a summative assessment covering a wide range of content, skills, and applications. Scores are reported to the teacher, school, district, and state levels for the purpose of student grades, curriculum review, student graduation requirements[1], and the optional use for the Educator Effectiveness System.

A Note About Assessed Grades:

The Algebra I EoC is based on the Common Core State Standards for Algebra I and was written for high school level courses. However, the assessment may be administered to students in grades 7 – 12 as long as they have completed a course in Algebra I with a curriculum based on the CCSS indicated on this blueprint

[1] The Algebra I EoC may only be used as an Alternate Demonstration of Competency (ADC) for students to meet assessment requirements in mathematics ***if the student passed the Algebra II course or its equivalent.***

Blueprint Table—Mathematics: Algebra I EoC

Based on CCSS High School: Algebra

Standard/ Content ID	Content Statement
A.CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
A.CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
A.REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.4	Solve quadratic equations in one variable.
A.REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
A.REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A.REI.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

Standard/ Content ID	Content Statement
A.REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
F.IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. 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. The graph of f is the graph of the equation y = f(x).
F.IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.
F.IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
F.IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
F.IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
F.BF.1	Write a function that describes a relationship between two quantities.
F.BF.3	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from

	their graphs and algebraic expressions for them.

Standard/ Content ID	Content Statement
F.LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
S.ID.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
S.ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.
S.ID.9	Distinguish between correlation and causation.
A.SSE.1	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
A.SSE.2	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
A.APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Algebra I EoC Reporting Category Alignment Framework					
Reporting Category	Common Core Standard	DOK (Item number by DOK)			Grand Total
		1	2	3	
Create and Rearrange Equations and functions	A.APR.1		#12, #13		2
	A.CED.1		#5		1
	A.CED.2		#26	#34	2
	A.CED.3		#36		1
	A.CED.4		#27		1
	A.SSE.1	#1			1
	A.SSE.2	#3, #33	#11		3
Solving Equations	A.REI.1		#20		1
	A.REI.3	#2, #31	#32		3
	A.REI.4	#4			1
	A.REI.6		#21		1
Graphing	A.REI.10		#22		1
	A.REI.12		#23		1
	F.BF.1		#35		1
	F.BF.3		#6		1
	F.LE.3		#7		1
Interpreting Functions	F.IF.1	#37			1
	F.IF.2		#14		1
	F.IF.3		#9		1
	F.IF.4		#15 #16, #17, #28, #29, #30		6
	F.IF.5		#18, #19		2
	F.IF.6		#10		1
	S.ID.7		#24, #25		2

Reporting Category #5	S.ID.8		#8		1
Grand Total		7	29	1	37

EOC BLUEPRINT

http://ped.state.nm.us/assessmentaccountability/assessmentevaluation/EOC/2015/Mathematics/Algebra%20I%20Blueprint%20v003.pdf

MATH TASK PRACTICE

Algebra 1

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MATH DEPARTMENT

Algebra 1

Unit 1

Name: _____ Date: _____ Period: ____

Teacher: _____

CC.9-12.N.RN.1

Evaluate :

1) $125^{1/3}$

2) $\sqrt[3]{8}^{2}$

CC.9-12.N.RN.2

Find the equivalent of $27^{2/3.}$ Select all that apply.

a) 9 b) 81 c) $\sqrt[3]{(27)}^{2}$ d) $(27^{1/3})^{2}$

CC.9-12.N.RN.3

Label the numbers as Rational or Irrational.

2/3 + ½ = _____ ¼ x 2/5 = _____

π + ¾ = _____ 2/3 x π = _____

CC.9-12.N.Q.1 to 3

Which is faster? 30ft/s or 100mph

How long will it take for a car to travel 4 miles if its speed is 25ft/s?

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Algebra 1
Unit 2

Name: _____ Date: _____ Period: ____

Teacher: _____

CC.9-12.A.SSE.1
Name the polynomials according to its degree and number of terms.

a) $3x^2 + 5x - 1$
b) $5x^3 + 3x - 6x + 8$
c) $2x^5 + 8 - 3$

CC.9-12.A.SSE.2
Show that $(x^2)^2 - (y^2)^2$ is equal to $(x^2 + y^2)(x^2 - y^2)$

CC.9-12.A.SSE.3
Find the zeroes of the function by factoring
$f(x) = x^2 - 3x - 40$

Find the zeroes of the function by completing the square.
$f(x) = x^2 + 14p - 38$

CC.9-12.A.SSE.4
Find the 7^{th} term of the number series.
6, 4, 8/3 . . .

CC.9-12.A.APR.1

Evaluate: a) $(3x^2 + 3x + 1) + (4x^2 - 6x + 8)$ b) $(9x^2 - 6x + 2) - (2x^2 + x - 2)$ c) $(2x + 7)(3x - 2)$

CC.9-12.A.CED.1

The sum of two numbers is 13. One number is 1 less than twice the other. Find the numbers.

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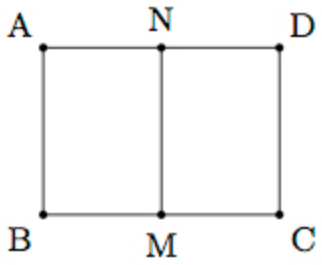
Algebra 1
Unit 3

Name: _____ *Date:* _____ *Period:* ____

Teacher: _____

CC.9-12.A.CED.2 to 4

Below is a picture of a rectangle $ABCD$ with segment $\overline{MN}$ drawn where M is the midpoint of $\overline{BC}$ and N is the midpoint of $\overline{AD}$:



Suppose $ABCD$ is similar to $BMNA$. What is $|BC||AB|$?

CC.9-12.A.REI.2to6

Alice and Briana each participate in a 5-kilometer race. Alice's distance covered, in kilometers, after t minutes can Ma
be modeled by the equation $a(t)=t4$. Briana's progress is modeled by the equation $b(t)=2t-1-----\sqrt{}$.

a. Who starts first? Explain.

b. Who gets to the finish line first? Explain.

c. At what time(s) during the race are Alice and Briana side by side? Explain.

CC.9-12.F.IF.1to3

John makes DVDs of his friend's shows. He has realized that, because of his fixed costs, his average cost per DVD depends on the number of DVDs he produces. The cost of producing x DVDs is given by

$$C(x)=2500+1.25x.$$

a. John wants to figure out how much to charge his friend for the DVDs. He's not trying to make any money on the venture, but he wants to cover his costs. Suppose John made 100 DVDs. What is the cost of producing this many DVDs? How much is this *per DVD*?

b. John is hoping to make many more than 100 DVDs for his friends. Complete the table showing his costs at different levels of production.

# of DVDs	0	10	100	1,000	10,000	100,000	1,000,000
Total Cost							
Cost per DVD							

c. Explain why the average cost per DVD levels off.

d. Find an equation for the average cost per DVD of producing x DVDs.

e. Find the domain of the average cost function.

f. Using the data points from your table above, sketch the graph of the average cost function. How does the graph reflect that the average cost levels off?

CC.9-12.F.BF.1to3

Kimi and Jordan are each working during the summer to earn money in addition to their weekly allowance. Kimi earns $9 per hour at her job, and her allowance is $8 per week. Jordan earns $7.50 per hour, and his allowance is $16 per week.

Ma

a. Jordan wonders who will have more income in a week if they both work the same number of hours. Kimi says, "It depends." Explain what she means.

b. Is there a number of hours worked for which they will have the same income? If so, find that number of hours. If not, why not?

c. What would happen to your answer to part (b) if Kimi were to get a raise in her hourly rate? Explain.

d. What would happen to your answer to part (b) if Jordan were no longer to get an allowance? Explain.

CC.9-12.F.LE.1to3

Below are pictures of the first three *triangular numbers*:

In general, the nth triangular number is the total number of dots in $n$columns where the columns have $1,2,3,\ldots,n$ dots.

a. The following picture relates the first three triangular numbers to areas of rectangles:

Use this idea to calculate the seventh triangular number, $1+2+3+4+5+6+7$.

b. Calculate the hundredth triangular number, $1+2+3+\cdots+98+99+100$.

c. Find a formula for calculating the nth triangular number, $1+2+\cdots+(n-1)+n$.

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Algebra 1
Unit 4

Name: _____ *Date:* _____ *Period:* ____

Teacher: _____

CC.9-12.A.APR.2to7
Find the zeroes of the function and graph.
1) $f(x) = x^2 + 5x - 14$

2) $f(x) = x^2 - 11x + 24$

Perform the operation

3) $x^2 + 3x - 10$ divided by $x + 5$

4) $x^2 - 8x - 48$ divided by $x - 12$

5) $(x + 4y)^2$

6) $(2x - 3y)(2x + 3y)$

CC.9-12.A.REI.4 and 7
Find the value of x and y.

7) $x^2 - 12 = 24$

8) $3x^2 + 7 = 82$

9) $2x + 5y = -13$

$5x - y = 8$

CC.9-12.F.IF.4to9

Graph the functions. Show/label the zeroes, y-intercept, axis of symmetry and vertex.

10) $f(x) = x^2 - 5x - 14$

11) $f(x) = x^2 - 16x + 72$

12) $f(x) = x^2 - x - 20$

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Algebra 1
Unit 5
Name: _____ *Date:* _____ *Period:* ____

Teacher: _____

Task
A statistically-minded state trooper wondered if the speed distributions are similar for cars traveling northbound and for cars traveling southbound on an isolated stretch of interstate highway. He uses a radar gun to measure the speed of all northbound cars and all southbound cars passing a particular location during a fifteen minute period. Here are his results:

Northbound Cars				
60	62	62	63	63
63	64	64	64	65
65	65	65	66	66
67	68	70	83	
Southbound Cars				
55	56	57	57	58
60	61	61	62	63
64	65	65	67	67
68	68	68	68	71

Ma

Draw box plots of these two data sets, and then use the plots and appropriate numerical summaries of the data to write a few sentences comparing the speeds of northbound cars and southbound cars at this location during the fifteen minute time period.