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JC Schools Tech Math II Yearly Standards

Units	Standards for Mathematical Practice
Getting Started **Days 19** **Unit End Date:** Sept. 12	1. Make sense of problems and persevere in solving them 2. Reason abstractly and quantitatively 3. Construct viable arguments and critique the reasoning of others 4. Model with mathematics 5. Use appropriate tools strategically 6. Attend to precision 7. Look for and make use of structure 8. Look for and express regularity in repeated reasoning

UNITS	Unit 1 Priority Standard(s)	
UNIT 1 **INTRODUCTION TO ALGEBRA** **Days 33**	**CED.A.1** Create equations and inequalities in one variable and use them to model and/or solve problems. **CED.A.2** Create and graph linear, quadratic and exponential equations in two variables. **SSE.A.1** Analyze the structure of polynomials to create equivalent expressions or equations.	
	Foundational Standards Grades 2-3	**Foundational Standards Grades 4 and up**
	3.NF.A.4 Demonstrate that two fractions are equivalent if they are the same size, or the same point on a number line. **3.RA.A.5**	**7.RP.A.2.c** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation. **7.EEI.A.2** Understand how to use equivalent expressions to clarify quantities in a problem

	Determine the unknown number in a multiplication or division equation relating three whole numbers. **3.RA.C.7** Multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. Know all products of two one-digit numbers **3.RA.C.8** Demonstrate fluency with products within 100. **3.RA.E.11** Identify arithmetic patterns and explain the patterns using properties of operations.	**7.EEI.A.1** Apply properties of operations to simplify and to factor linear algebraic expressions with rational coefficients. **6.NS.B.4.b** Find common factors and multiples: b. Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers. **6.EEI.B.8.a&b** Recognize that inequalities may have infinitely many solutions. a. Write an inequality of the form x>c,x<c, or x is greater than or equal to c, x is less than or equal to c to represent a constraint or condition. b. Graph the solution set of an inequality. **6.EEI.B.7** Solve one-step linear equations in one variable involving non-negative rational numbers. **6.EEI.B.6** Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation. **6.EEI.B.5** Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true. **6.EEI.B.4** Use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true. **6.EEI.A.3**

		Identify and generate equivalent algebraic expressions using mathematical properties **5.RA.B.4** Translate written expressions into algebraic expressions **5.RA.B.3** Write, evaluate and interpret numeric expressions using the order of operations. **5.RA.A.2** Write a rule to describe or explain a given numeric pattern. **5.RA.A.1** Investigate the relationship between two numeric patterns. a. Generate two numeric patterns given two rules. b.Translate two numeric patterns into two sets of ordered pairs. c. Graph numeric patterns on the Cartesian coordinate plane. d. Identify the relationship between two numeric patterns. **5.NBT.A.4** Evaluate the value of powers of 10 and understand the relationship to the place value system. **5.GM.C.6.a-d** Define a first quadrant Caresian coordinate System a. Represent the axes as scaled perpendicular number lines that both intersect at 0, the origin. b. Identify any point on the Cartesian coordinate plane by its ordered pair coordinates. c. Define the first number in an ordered pair as the horizontal distance from the origin d. Define the second number in an ordered pair as the vertical distance from the origin **4.RA.C.6** Generate a number pattern that follows a given rule.

UNIT 2

FACTORING AND SOLVING QUADRATIC EQUATIONS

Days 44

SSE.A.1
Interpret the contextual meaning of individual terms or factors from a given problem that utilizes formulas or expressions.

SSE.A.2
Analyze the structure of polynomials to create equivalent expressions or equations,

SSE.A.3.a&b
Choose and produce equivalent forms of quadratic expression or equations to reveal and explain properties.

a. Find the zeros of a quadratic function by rewriting it in factored form.

b. Find the maximum or minimum value of a quadratic function by completing the square,

A1.CED.A.1
Create equations and inequalities in one variable and use them to model and/or solve problems

Foundational Standards Grades 2-3	Foundational Standards Grades 4 and up
3.RA.D.9 Write and solve two-step problems involving variables using any of the four operations.	**A1.NQ.A.1** Explain how the meaning of rational exponents extends from the properties of integer exponents. **A1.NQ.A.2** Rewrite expressions involving radicals and rational exponents using the properties of exponents. Limit to rational exponents with a numerator of 1. **8.EEI.A.2** Investigate concepts of square and cube roots. a. Solve equations of the form x2 = p and x3 = p, where p is a positive rational number. **7.EEI.A.1** Apply properties of operations to simplify and to factor linear algebraic expressions with rational coefficients. **6.EEI.A.2** Create and evaluate expressions involving variables and whole number exponents. a. Identify parts of an expression using mathematical terminology.

		b. Evaluate expressions at specific values of the variables. c. Evaluate non-negative rational number expressions. d. Write and evaluate algebraic expressions e. Understand the meaning of the variable in the context of the situation **6.EEI.B.5** Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true. **6.EEI.B.6** Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation. **6.NS.A.1.a** Compute and interpret quotients of positive fractions. a. Solve problems involving division of fractions by fractions. **6.NS.B.4.b** Find common factors and multiples: b. Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers. **4.RA.B.4** Recognize that a whole number is a multiple of each of its factors and find the multiples for a given whole number **4.RA.B.5** Determine if a whole number within 100 is composite or prime, and find all factor pairs for whole numbers
UNIT 3	**A1.F.B.3** Using tables, graphs and verbal descriptions, interpret key characteristics of a function that models the relationship between two quantities **A1.IF.C.7**	

EXPONENTIAL FUNCTIONS **Days 28**	Graph functions expressed symbolically and identify and interpret key features of the graph. **A1.REI.C6** Explain that the graph of an equation in two variables is the set of all its solutions plotted in the Cartesian coordinate plane.	
	Foundational Standards Grades 2-3	**Foundational Standards Grades 4 and up**
	3.DS.A.1 Create frequency tables, scaled picture graphs and bar graphs to represent a data set with several categories. **3.DS.A.2** Solve one- and two-step problems using information presented in bar and/or picture graphs. **3.DS.A.3** Create a line plot to represent data. **2.DS.A.4** Solve problems using information presented in line plots, picture graphs and bar graphs **2.DS.A.5** Draw conclusions from line plots, picture graphs and bar graphs	**A1.LQE.A.1.a** Determine that linear functions change by equal differences over equal intervals. **A2.IF.A.1** Identify and interpret key characteristics of functions represented graphically, with tables and with algebraic symbolism to solve problems. **8.F.A.1.b** Determine if a relation is a function. **8.EEI.B.5** Graph proportional relationships. a. Interpret the unit rate as the slope of the graph. b. Compare two different proportional relationships. **8.EEI.B.6.a&b** Apply concepts of slope and y-intercept to graphs, equations and proportional relationships. a. Explain why the slope (m) is the same between any two distinct points on a non-vertical line in the Cartesian coordinate plane. b. Derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. **8.F.A.1.a-c** Explore the concept of functions. (The use of function notation is not required.) a. Understand that a function assigns to each input exactly one output. b. Determine if a relation is a function. c. Graph a function.

		b. Determine if a relation is a function. c. Graph a function. c. Graph a function. **8.F.A.2** Compare characteristics of two functions each represented in a different way. **8.F.B.4** Use functions to model linear relationships between quantities. a.Explain the parameters of a linear function based on the context of a problem b.Determine the parameters of a linear function c.Determine the x-intercept of a linear function **8.F.B.5** Describe the functional relationship between two quantities from a graph or a verbal description **6.RPA.3.a-d** Solve problems involving ratios and rates. a. Create tables of equivalent ratios, find missing values in the tables and plot the pairs of values on the Cartesian coordinate plane. b. Solve unit rate problems. c. Solve percent problems. d. Convert measurement units within and between two systems of measurement. **5.GM.C.6** Define a first quadrant Cartesian coordinate system. a. Represent the axes as scaled perpendicular number lines that both intersect at 0, the origin. b. Identify any point on the Cartesian coordinate plane by its ordered pair coordinates. c. Define the first number in an ordered pair as the horizontal distance from the origin d. Define the second number in an ordered pair as the vertical distance from the origin.

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<tr><td></td><td></td><td>5.GM.C.7
Plot and interpret points in the first quadrant of the Cartesian coordinate plane.

5.RA.A.1
Investigate the relationship between two numeric patterns.
a. Generate two numeric patterns given two rules.
b.Translate two numeric patterns into two sets of ordered pairs.
c, Graph numeric patterns on the Cartesian coordinate plane.
d. Identify the relationship between two numeric patterns</td></tr>
<tr><td rowspan="2">UNIT 4

SYSTEMS

Days 43</td><td colspan="2"><u>REI.B.3</u>
Solve a system of linear equations algebraically and/or graphically
<u>REI.C.8</u>
Solve problems involving a system of linear inequalities.</td></tr>
<tr><td>Foundational Standards Grades 2-3</td><td>Foundational Standards Grades 4 and up</td></tr>
<tr><td></td><td>3.RA.A.5
Determine the unknown number in a multiplication or division equation relating three whole numbers.

3.NBT.A.3
Demonstrate fluency with addition and subtraction within 1000.

3.RA.A.1
Interpret products of whole numbers.

3.RA.A.2
Interpret quotients of whole numbers

3.RA.A.4
Use multiplication and division within 100 to solve problems.</td><td>8.EEI.C.8.a-d
Analyze and solve systems of linear equations.
a. Graph systems of linear equations and recognize the intersection as the solution to the system.
b. Explain why solution(s) to a system of two linear equations in two variables correspond to point(s) of intersection of the graphs.
c. Explain why systems of linear equations can have one solution, no solution or infinitely many solutions.
d. Solve systems of two linear equations

7.EEI.A.1
Apply properties of operations to simplify and to factor linear algebraic expressions with rational coefficients

7.EEI.B.4
Write and/or solve linear equations and inequalities in one variable.</td></tr>
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	2.NBT.B.8 Add or subtract within 1000, and justify the solution **2.NBT.C.11** Write and solve problems involving addition and subtraction within 100	a. Write and/or solve equations of the form x+p = q and px = q in which p and q are rational numbers. b. Write and/or solve two step equations px+q=r and p(x+q) =r, where p,q and r are rational numbers, and interpret the meaning of the solution in the context of the problem. c. Write, solve and/or graph inequalities of the form px + q > r or px + q < r, where p, q and r are rational numberbers. **6.EEI.A.2** Create and evaluate expressions involving variables and whole number exponents. a. Identify parts of an expression using mathematical terminology. b. Evaluate expressions at specific values of the variables. c. Evaluate non-negative rational number expressions. d. Write and evaluate algebraic expressions e. Understand the meaning of the variable in the context of the situation. **6.EEI.B.4** Use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true. **6.EEI.B.5** Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true. **6.EEI.B.6** Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation. **6.EEI.B.7** Solve one-step linear equations in one variable involving non-negative rational numbers **6.EEI.B.8.a&b**

		Recognize that inequalities may have infinitely many solutions. a. Write an inequality of the form x>c, x<c, x less than or equal to c to represent a constraint or condition. b. Graph the solution set of an inequality. **6.GM.A.3.a-d** Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane a. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the Cartesian coordinate plane b. Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes c. Find distances between points with the same first coordinate or the same second coordinate **6.NS.C.5** Use positive and negative numbers to represent quantities. **6.NS.C.6.c** Locate a rational number as a point on the number line c. Understand that a number and its opposite (additive inverse) are located on opposite sides of zero on the number line. **6.NS.C.7** Understand that the absolute value of a rational number is its distance from 0 on the number line.