

Algebra I Module

Unit 1 - [Expressions, Linear Equations and Inequalities \(Chapter 1\)](#)

Unit 2 - [Inequalities \(Chapter 2\)](#)

Unit 3 - [Introduction to Functions and Linear Functions \(Chapter 3, Chapter 4\)](#)

Unit 4 - [Systems of Equations and Inequalities \(Chapter 5\)](#)

Unit 5 - [Factoring Polynomials, Quadratic Functions and Equations\(Chapter 7, Chapter 8\)](#)

Unit 6 - [Exponents and Polynomials \(Chapter 6\)](#)

Unit 7 - [Data Analysis \(Chapter 10\)](#) (as time permits)

Course description

Access to higher mathematics is essential and Algebra I is a course that provide an important entry point for the pathway to success by extending students' understanding and application of skills concepts and language of algebra.

KPBSD MATH CURRICULUM ALGEBRA I

UNIT 1 – EXPRESSIONS, LINEAR EQUATIONS, AND INEQUALITIES

Desired Results

Priority Standards	Transfer	
<p>A.SSE.1. Interpret expressions that represent a quantity in terms of its context.</p> <p>a. Interpret parts of an expression, such as terms, factors, and coefficients.</p> <p>b. Interpret complicated expressions by viewing one or more of their parts as a single entity.</p> <p>A.SSE.2. Use the structure of an expression to identify ways to rewrite it.</p> <p>A.REI.1. Apply properties of mathematics to justify steps in solving equations in one variable.</p> <p>A.REI.3. Solve linear equations in one variable. Solve linear equations with coefficients represented by letters.</p> <p>A.CED.1. Create equations in one variable and use them to solve problems using Linear functions.</p> <p>A.CED.4. Rearrange formulas (literal equations) to highlight a quantity of interest, using the same reasoning as in solving equations.</p> <p>N.Q.1. 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.</p> <p>N.Q.2. Define appropriate quantities for the purpose of descriptive modeling.</p> <p>N.Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>	<p>Students will be able to independently use their learning to...</p> <p>Choose procedures to solve equations efficiently.</p> <p>Differentiate between accuracy and precision.</p>	
	Meaning	
	<p style="text-align: center;">ENDURING UNDERSTANDINGS</p> <p>Students will understand that...</p> <ul style="list-style-type: none"> • Linear equations and formulas are used in a variety of ways. 	<p style="text-align: center;">ESSENTIAL QUESTIONS</p> <p>Students will keep considering...</p> <ul style="list-style-type: none"> • What are the ways I can use linear equations and formulas to solve problems?
	Acquisition	
<p>Students will know...</p> <ul style="list-style-type: none"> • Definition of an expression. • How to interpret parts of an expression. • Properties of equality. • Distributive property. • Order of operations. • Definition of a linear equation in one variable. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> • I can translate between words and algebra. • I can evaluate algebraic expressions. • I can solve one-step equations in one variable by using addition or subtraction. • I can solve one-step equations in one variable by using multiplication or division. • I can solve equations in one variable that contain more than one operation. • I can solve equations in one variable that contain variable terms on both sides. • I can solve a formula for a given variable. • I can solve an equation in two or more variables for one the variables. • I can solve equations in one variable that contain absolute-value expressions. • I can write and use ratios, rates, and unit rates. • I can write and solve proportions. 	

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		<ul style="list-style-type: none"> • I can use proportions to solve problems involving geometric figures. • I can use proportions and similar figures to measure objects indirectly.
Evidence		
Evaluative Criteria	Assessment Evidence	
Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...	PERFORMANCE TASK(S): To be determined	
Learning Plan		
<p>Ch 1: Sections 1.1 - 1.10</p> <p>Mathematical practices:</p> <ul style="list-style-type: none"> • Section 1.1, Variables and Expressions <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #10-11, 16, 25-26, 31,36-38,42-43, 54 ○ Construct viable arguments and critique the reasoning of others #32, 34 ○ Look for and make use of structure #38 • Section 1.2, Solving Equations by Adding or Subtracting <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #20, 49, 58-60,64-65,70 ○ Construct viable arguments and critique the reasoning of others #50, 66-67 ○ Model with mathematics #61-63 • Section 1.3, Solving Equations by Multiplying or Dividing <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #19-20, 45-46, 56-60, 65, 74-75 ○ Construct viable arguments and critique the reasoning of others #47, 76 ○ Look for and express regularity in repeated reasoning #94 		

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UNIT 1 – EXPRESSIONS, LINEAR EQUATIONS, AND INEQUALITIES

- Section 1.4, Solving Two-step and Multi-step Equations
 - Make sense of problems and persevere in solving them #19, 42, 53, 62–67, 73
 - Construct viable arguments and critique the reasoning of others #68–69
 - Model with mathematics #47–49
- Section 1.5, Solving Equations with Variables on Both Sides
 - Make sense of problems and persevere in solving them #14, 33, 52, 54, 56
 - Reason abstractly and quantitatively #55, 69–71
 - Construct viable arguments and critique the reasoning of others #57
 - Model with mathematics #53, 58
- Section 1.6, Solving for a Variable
 - Make sense of problems and persevere in solving them #2, 8–9, 30–31, 34, 45
 - Reason abstractly and quantitatively #29
 - Construct viable arguments and critique the reasoning of others #32–33
- Section 1.7, Solving Absolute-value Equations
 - Make sense of problems and persevere in solving them #13, 29–34, 42–44
 - Construct viable arguments and critique the reasoning of others #45–46, 51
 - Model with mathematics #35–38
 - Look for and make use of structure #39–41
- Section 1.8, Rates, Ratios, and Proportions
 - Make sense of problems and persevere in solving them #2 –9, 19–25, 38–40, 42–43, 56–58, 63–65
 - Construct viable arguments and critique the reasoning of others #41–42
- Section 1.9, Applications of proportions N.Q.1
 - Model with mathematics #10-11, 22
 - Reason abstractly #23
- Section 1.10, Precision and Accuracy N.Q.2, N.Q.3
 - Attend to precision #3-10, 19-27, 37-51, 66
 - Construct viable arguments and critique the reasoning of others #62-63

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UNIT 1 – EXPRESSIONS, LINEAR EQUATIONS, AND INEQUALITIES

Vocabulary

Accuracy
Equation
Formula
Unit rate

Identity
Indirect measurement
Literal equation
Precision

Proportion
Ratio
Tolerance

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UNIT 2 – INEQUALITIES

Desired Results

<p style="text-align: center;">Priority Standards</p> <p>A.REI.1. Apply properties of mathematics to justify steps in solving equations in one variable.</p> <p>A.REI.3. Solve inequalities in one variable. Solve linear equations with coefficients represented by letters.</p> <p>A.SSE.1. Interpret expressions that represent a quantity in terms of its context.</p> <p style="margin-left: 20px;">a. Interpret parts of an expression, such as terms, factors, and coefficients.</p> <p style="margin-left: 20px;">b. Interpret complicated expressions by viewing one or more of their parts as a single entity.</p> <p>A.CED.1. Create inequalities in one variable and use them to solve problems using Linear functions.</p> <p>A.CED.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing cost constraints in various situations.</p>	Transfer	
	<p>Students will be able to independently use their learning to...</p> <p>Solve multi-step inequalities.</p> <p>Write and solve inequalities to solve problems.</p>	
	Meaning	
	ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
	<p>Students will understand that...</p> <ul style="list-style-type: none"> • Linear inequalities are used to solve a variety of real-world problems. 	<p>Students will keep considering...</p> <ul style="list-style-type: none"> • How are inequalities and equations alike? How are they different? • How do the words “and” and “or” affect the outcome of an inequality?
Acquisition		
<p>Students will know...</p> <ul style="list-style-type: none"> • How to identify solutions of inequalities in one variable. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> • I can write and graph inequalities in one variable. • I can solve one-step inequalities by using addition and subtraction. • I can solve one-step inequalities by using multiplication and division. • I can solve inequalities that contain more than one operation. • I can solve inequalities that contain variable terms on both sides. • I can solve compound inequalities in one variable. • I can graph solution sets of compound inequalities in one variable. 	

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UNIT 2 – INEQUALITIES

Evidence

Evaluative Criteria	Assessment Evidence
Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...	PERFORMANCE TASK(S): To be determined

Learning Plan

Chapter 2: Sections 2.1 - 2.6

Mathematical practices:

- Section 2.1, Graphing and Writing Inequalities:
 - make sense of problems and persevere in solving them #55, 56
 - construct viable arguments and critique the reasoning of others #54, 57, 58, 69
 - model with mathematics #16, 17, 32, 33, 42-45
- Section 2.2, Solving Inequalities by Adding or Subtracting:
 - Make sense of problems and persevere in solving them. #5–6, 11–12, 25, 31, 35
 - Reason abstractly and quantitatively #30
 - Construct viable arguments and critique the reasoning of others. #32–34, 46
 - Model with mathematics #13–15
 - Look for and make use of structure #43–45
- Section 2.3, Solving Inequalities by Multiplying or Dividing:
 - Make sense of problems and persevere in solving them #17, 42, 56, 61–62, 65–66
 - Reason abstractly and quantitatively #75
 - Construct viable arguments and critique the reasoning of others #55, 63–64, 70, 76–77
 - Model with mathematics #51–54
- Section 2.4, Solving Two-Step and Multi-Step Inequalities:
 - Make sense of problems and persevere in solving them #15, 37, 59–61
 - Construct viable arguments and critique the reasoning of others #62–63
- Section 2.5, Solving Inequalities with Variables on Both Sides:

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UNIT 2 – INEQUALITIES

- Make sense of problems and persevere in solving them #7, 26, 49–51, 56–57
- Reason abstractly and quantitatively #70–71
- Construct viable arguments and critique the reasoning of others #58–60, 72
- Section 2.6, Solving Compound Inequalities:
 - Make sense of problems and persevere in solving them #2, 15, 28–29, 34–35, 42–43
 - Reason abstractly and quantitatively #30–33, 55–56
 - Construct viable arguments and critique the reasoning of others #44–46

Compound inequality
Inequality

Intersection
Solution of an inequality

Union

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UNIT 3 – INTRODUCTION TO FUNCTIONS AND LINEAR FUNCTIONS

Desired Results

Priority Standards	Transfer	
<p>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 $y = f(x)$.</p> <p>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.</p> <p>F.IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. <i>For example, The Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.</i></p> <p>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.</p> <p>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 negative numbers would be an inappropriate domain for the function.</p>	<p>Students will be able to independently use their learning to...</p> <p>Use tables, diagrams, graphs, and equations to describe functions.</p> <p>Translate among representations of functions.</p> <p>Use functions to represent, analyze, and solve problems.</p> <p>Translate among different representations of linear functions.</p> <p>Find and interpret slopes and intercepts of linear equations that model real-world problems.</p> <p>Solve real-world problems involving linear equations.</p>	
	Meaning	ENDURING UNDERSTANDINGS
	<p>Students will understand that...</p> <ul style="list-style-type: none"> • Lines on a graph can be represented by a linear function, and linear functions can model real world problems. 	<p>Students will keep considering...</p> <ul style="list-style-type: none"> • How can a real-world relationship be modeled using a two-variable equation, a graph, a table, or a word description? • What does the slope of a line indicate about the line? • What information does the equation of a line give me?

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UNIT 3 – INTRODUCTION TO FUNCTIONS AND LINEAR FUNCTIONS

<p>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.</p> <p>F.IF.7a. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</p> <p>a. Graph linear and quadratic functions and show intercepts, maxima, and minima.</p> <p>F.IF.7b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.</p> <p>A.CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p>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).</p> <p>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.</p> <p>F.BF.1. Write a function that describes a relationship between two quantities,</p> <p>a. Determine an explicit expression, a recursive process, or steps for calculation from a context.</p> <p>b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding</p>	Acquisition	
	<p>Students will know...</p> <ul style="list-style-type: none"> • Function concepts and their applications. • Characteristics of linear functions. • Application of linear functions. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> • I can analyze simple graphs and match with situations. • I can graph a relationship. • I can identify functions. • I can find the domain and range of relations and functions. • I can identify independent and dependent variables. • I can write an equation in function notation and evaluate a function for given values. • I can graph functions given a limited domain. • I can graph functions given a domain of all real numbers. • I can create and interpret scatter plots. • I can use trend lines to make predictions. • I can recognize and extend an arithmetic sequence. • I can find a given term of an arithmetic sequence. • I can identify linear functions and linear equations. • I can graph linear functions that represent real-world situations and give their domain and range. • I can find x- and y-intercepts and interpret their meanings in real-world situations. • I can use x- and y-intercepts to graph lines. • I can find rates of change and slopes. • I can relate a constant rate of change to the slope of a line.

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UNIT 3 – INTRODUCTION TO FUNCTIONS AND LINEAR FUNCTIONS

<p>a constant function to a decaying exponential, and relate these functions to the model.</p> <p>c. Compose functions. <i>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.</i></p> <p>F.BF.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. Build new functions from existing functions.</p> <p>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.</p> <p>F.LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or input-output table of values.</p> <p>F.LE.5. Interpret the parameters in a linear or exponential function in terms of a context.</p> <p>S.ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p> <p>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</p> <p>b. Informally assess the fit of a function by plotting and</p>		<ul style="list-style-type: none">• I can find the slope by using the slope formula.• I can identify, write, and graph direct variation.• I can write a linear equation in slope-intercept form.• I can graph a line using slope-intercept form.• I can graph a line and write a linear equation using point-slope form.• I can write a linear equation given two points.• I can determine a line of best fit for a set of linear data.• I can determine and interpret the correlation coefficient.• I can identify and graph parallel and perpendicular lines.• I can write equations to describe lines parallel or perpendicular to a given line.• I can graph absolute-value functions.• I can identify characteristics of absolute-value functions and their graphs.
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UNIT 3 – INTRODUCTION TO FUNCTIONS AND LINEAR FUNCTIONS

<p>analyzing residuals. <i>For example, Describe solutions to problems that require interpolation and extrapolation.</i></p> <p>c. Fit a linear function for a scatter plot that suggests a linear association.</p> <p>G.GPE.5. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).</p>		
Evidence		
Evaluative Criteria	Assessment Evidence	
Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...	PERFORMANCE TASK(S): To be determined	
Learning Plan		
Ch 3: Sections 3.1 - 3.5 Mathematical practices: <ul style="list-style-type: none"> • Section 3.1, Graphing Relationships 		

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UNIT 3 – INTRODUCTION TO FUNCTIONS AND LINEAR FUNCTIONS

- Make sense of problems and persevere in solving them #18–19, 22
- Construct viable arguments and critique the reasoning of others #20–21
- Model with mathematics #3–5, 7–12, 14–16, 26–28
- Use appropriate tools strategically #17
- Section 3.2, Relations and Functions
 - Make sense of problems and persevere in solving them #21–26, 29
 - Construct viable arguments and critique the reasoning of others #27–28, 30–31
 - Look for and make use of structure #3–20
- Section 3.3, Writing Functions
 - Make sense of problems and persevere in solving them #12, 23–24, 28, 32, 37
 - Reason abstractly and quantitatively #27, 36
 - Construct viable arguments and critique the reasoning of others #29–31
 - Look for and make use of structure #3–11, 13–22
- Section 3.4, Graphing Functions
 - Make sense of problems and persevere in solving them #12, 27, 55, 63
 - Reason abstractly and quantitatively #56
 - Construct viable arguments and critique the reasoning of others #44, 53, 57
 - Look for and make use of structure #1-11, 13-26, 28-43, 45-53, 62
- Section 3.5, Scatter Plots and Trend Lines
 - Make sense of problems and persevere in solving them #4, 13–14, 21, 24, 27, 32–33
 - Reason abstractly and quantitatively #5–12, 15–20, 22, 25–26, 28
 - Construct viable arguments and critique the reasoning of others #23
- Section 3.6, Arithmetic Sequences
 - Make sense of problems and persevere in solving them #8, 15, 33, 38–39, 41, 47
 - Construct viable arguments and critique the reasoning of others #32, 40
 - Look for and make use of structure #2–7, 9–14, 16–31, 34–37, 45–46

Ch 4: Sections 4.1 - 4.9

Mathematical practices:

- Section 4.1, Identifying Linear Functions
 - Make sense of problems and persevere in solving them #13–14, 25, 50–51, 54, 55, 61–63

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- Construct viable arguments and critique the reasoning of others #52–53, 56, 59
- Look for and make use of structure #2–12, 15–24, 26–49, 60
- Section 4.2, Using Intercepts
 - Make sense of problems and persevere in solving them #8, 22–23, 30–32, 38
 - Construct viable arguments and critique the reasoning of others #33, 39
 - Use appropriate tools strategically #2–7, 9–12, 13–21, 24–29
 - Look for and make use of structure #34–37, 46
- Section 4.3, Rate of Change and Slope
 - Make sense of problems and persevere in solving them #2–3, 12–13, 20, 22–24, 26–27, 32–33
 - Construct viable arguments and critique the reasoning of others #21, 25
 - Use appropriate tools strategically #4–7, 14–17, 28
 - Attend to precision #27
 - Look for and make use of structure #8–11, 18–19
- Section 4.4, The Slope Formula
 - Make sense of problems and persevere in solving them #22, 25
 - Reason abstractly and quantitatively #6–7, 16–17
 - Construct viable arguments and critique the reasoning of others #21, 23–24
 - Look for and make use of structure #1–5, 8–15, 18–20, 29–37
- Section 4.5, Direct Variation
 - Make sense of problems and persevere in solving them #9, 17, 20–37, 40, 45
 - Construct viable arguments and critique the reasoning of others #18–19, 38–39
 - Look for and make use of structure #2–8, 10–16, 46
- Section 4.6, Slope-Intercept Form
 - Make sense of problems and persevere in solving them #13, 26–27, 36
 - Reason abstractly and quantitatively #43
 - Construct viable arguments and critique the reasoning of others #28–31, 35, 44
 - Look for and make use of structure #32–34, 42
- Section 4.7, Point-Slope Form
 - Make sense of problems and persevere in solving them #16, 34–36, 43, 52–53
 - Reason abstractly and quantitatively #40–42, 56–58

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- Construct viable arguments and critique the reasoning of others #49–51
- Section 4.8, Line of Best Fit
 - Make sense of problems and persevere in solving them #4–6, 8–10, 13–16, 19
 - Reason abstractly and quantitatively #3, 7
 - Construct viable arguments and critique the reasoning of others #11–12
 - Look for and make use of structure #20
- Section 4.9, Slopes of Parallel and Perpendicular Lines
 - Make sense of problems and persevere in solving them #51
 - Construct viable arguments and critique the reasoning of others #4, 7, 12, 16, 48, 50, 55, 58
 - Attend to precision #49
 - Look for and make use of structure #18–21

Vocabulary

Arithmetic sequence
 Common difference
 Constant of variation
 Correlation
 Dependent variable
 Direct variation
 Domain

Function
 Function notation
 Independent variable
 Linear function
 No correlation
 Parallel lines
 Family of function

Relation
 Scatter plot
 Sequence
 Slope
 Transformation
 X-intercept
 Y-intercept

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UNIT 4 – SYSTEMS OF EQUATIONS AND INEQUALITIES

Desired Results

Priority Standards	Transfer	
<p>A.REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> <p>A.REI.5. Show 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.</p> <p>A.REI.6. Solve systems of linear equations exactly and approximately, e.g., with graphs or algebraically, focusing on pairs of linear equations in two variables.</p> <p>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.*</p> <p>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.</p>	<p>Students will be able to independently use their learning to... Solve real-world problems involving systems of linear equations and inequalities.</p>	
	Meaning	
	ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
	<p>Students will understand that...</p> <ul style="list-style-type: none"> • Systems of linear equations and inequalities can be used to model and solve problems. • Systems of linear equations have different methods to solve the system. 	<p>Students will keep considering...</p> <ul style="list-style-type: none"> • How are systems of linear equations and inequalities useful in interpreting real-world situations? • How can I graph linear inequalities and systems of linear inequalities? • How do I find an exact or approximate solution to systems of linear equations?
Acquisition		
<p>Students will know...</p> <ul style="list-style-type: none"> • Concepts and applications of linear systems and inequalities. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> • I can identify solutions of systems of linear equations in two variables. • I can solve systems of linear equations in two variables by graphing. • I can solve systems of linear equations in two variables by substitution. • I can solve systems of linear equations in two variables by elimination. • I can compare and choose an appropriate method for solving systems of linear equations. • I can solve special systems of linear equations in two variables. • I can classify systems of linear equations and determine the number of solutions. 	

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UNIT 4 – SYSTEMS OF EQUATIONS AND INEQUALITIES

		<ul style="list-style-type: none"> • I can graph and solve linear inequalities in two variables. • I can graph and solve systems of linear inequalities in two variables.
Evidence		
Evaluative Criteria	Assessment Evidence	
Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...	PERFORMANCE TASK(S): To be determined	
Learning Plan		
<p>Ch 5: Sections 5.1 - 5.6</p> <p>Mathematical practices:</p> <ul style="list-style-type: none"> • Section 5.1, Solving Systems by Graphing <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #8, 16–18, 23–25, 31–32 ○ Construct viable arguments and critique the reasoning of others #26–27 ○ Use appropriate tools strategically #19–22 • Section 5.2, Solving Systems by Substitution <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #7, 17, 24–31, 34, 38 ○ Construct viable arguments and critique the reasoning of others #32–33 ○ Attend to precision #35 • Section 5.3, Solving Systems by Elimination <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #10, 20–21, 23, 30–31, 35, 39 ○ Construct viable arguments and critique the reasoning of others #22, 32 ○ Look for and make use of structure #24–29 		

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UNIT 4 – SYSTEMS OF EQUATIONS AND INEQUALITIES

- Section 5.4, Solving Special Systems
 - AM Make sense of problems and persevere in solving them #11, 23–27, 30
 - Reason abstractly and quantitatively #28
 - Construct viable arguments and critique the reasoning of others #29, 31–32
 - Look for and make use of structure #35–36
- Section 5.5, Solving Linear Inequalities
 - Make sense of problems and persevere in solving them #9, 19, 22, 27–28, 37, 40
 - Construct viable arguments and critique the reasoning of others #38–39, 41–42
- Section 5.6, Solving Systems of Linear Inequalities
 - Make sense of problems and persevere in solving them #15, 29–30, 38, 40, 42
 - Construct viable arguments and critique the reasoning of others #39, 41, 43
 - Attend to precision #47
 - Look for and make use of structure #48, 50

Vocabulary

Consistent system Dependent system Inconsistent system	Independent system Linear inequality	Solution of a linear inequality System of linear equations
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UNIT 5 – FACTORING POLYNOMIALS, QUADRATIC FUNCTIONS, AND EQUATIONS

Desired Results

Priority Standards	Transfer	
<p>A.SSE.2 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 $(x^2 - y^2)(x^2 + y^2)$.</p> <p>A.SSE3a. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p>a. Factor a quadratic expression to reveal the zeros of the function it defines. For example, $x^2 + 4x + 3 = (x + 3)(x + 1)$.</p> <p>A.REI.4b. Solve quadratic equations in one variable.</p> <p>a. 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 $a \pm bi$ for real numbers a and b.</p> <p>A.APR.3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.</p> <p>F.IF.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the</p>	<p>Students will be able to independently use their learning to...</p> <p>Factor polynomials.</p> <p>Apply factoring techniques to solve problems involving area and volume.</p> <p>Graph quadratic functions.</p> <p>Solve quadratic equations.</p> <p>Use quadratic functions and equations to solve real-world problems.</p>	
	Meaning	
	ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
	<p>Students will understand that...</p> <ul style="list-style-type: none"> Quadratics and polynomials can be solved by factoring Quadratic and polynomial functions can model real world problems. 	<p>Students will keep considering...</p> <ul style="list-style-type: none"> How can I use the rules of polynomials to rewrite an expression in factored form? Why do I factor polynomials? When might it be a good idea to not factor and use a different method for solving quadratic equations?
Acquisition		
<p>Students will know...</p> <ul style="list-style-type: none"> Factoring methods and their application. Quadratic functions concepts. Methods for solving quadratic functions. Applications of quadratic functions. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> I can write the prime factorization of numbers. I can find the GCF of monomials. I can factor polynomials by using the greatest common factor. I can factor quadratic trinomials. I can factor perfect-square trinomials. I can factor the difference of two squares. I can choose an appropriate method for factoring a polynomial. I can combine methods for factoring a polynomial. 	

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UNIT 5 – FACTORING POLYNOMIALS, QUADRATIC FUNCTIONS, AND EQUATIONS

<p>graph, and interpret these in terms of a context.</p> <p>b. Use the properties of exponents to interpret expressions for exponential functions. <i>For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12t$, $y = (1.2)t/10$, and classify them as representing exponential growth or decay.</i></p> <p>F.IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically, in tables, or by verbal descriptions). <i>For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.</i></p>		<ul style="list-style-type: none"> • I can identify quadratic functions and determine whether they have a minimum or maximum. • I can graph a quadratic function and give its domain and range. • I can find the zeros of a quadratic function from its graph. • I can find the axis of symmetry and the vertex of a parabola. • I can graph a quadratic function written in standard form. • I can graph and transform quadratic functions. • I can solve quadratic equations by graphing, factoring, and using square roots. • I can solve quadratic equations by using the Quadratic Formula. • I can determine the number of solutions of a quadratic equation by using the discriminant of solutions. • I can graph and solve linear inequalities in two variables. • I can graph and solve systems of linear inequalities in two variables.
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Evidence

Evaluative Criteria	Assessment Evidence
Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...	PERFORMANCE TASK(S): To be determined

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UNIT 5 – FACTORING POLYNOMIALS, QUADRATIC FUNCTIONS, AND EQUATIONS

Learning Plan

Ch 7: Sections 7.1 - 7.6

Mathematical practices:

- Section 7.1, Factors and Greatest Common Factors
 - Make sense of problems and persevere in solving them #16, 31, 38–39, 56, 59
 - Reason abstractly and quantitatively #66–68
 - Construct viable arguments and critique the reasoning of others #36–37
 - Look for and make use of structure #46
- Section 7.2, Factoring by GCF
 - Make sense of problems and persevere in solving them #11, 36, 63, 66, 68, 80
 - Construct viable arguments and critique the reasoning of others #64–65, 67, 69–70
- Section 7.3, Factoring $x^2 + bx + c$
 - Make sense of problems and persevere in solving them #52–53, 60–62, 71
 - Reason abstractly and quantitatively #63–66, 83–85
 - Construct viable arguments and critique the reasoning of others #16, 32, 37, 50, 72
 - Model with mathematics #54–56
 - Attend to precision #51
 - Look for and make use of structure #57–59, 67–70
- Section 7.4, Factoring $ax^2 + bx + c$
 - Make sense of problems and persevere in solving them #68–69, 71
 - Reason abstractly and quantitatively #87–89
 - Construct viable arguments and critique the reasoning of others #65, 70, 76
 - Model with mathematics #52–54, 64
 - Look for and make use of structure #66–67, 72–75
- Section 7.5, Factoring Special Products
 - Make sense of problems and persevere in solving them #42, 48, 59, 64
 - Construct viable arguments and critique the reasoning of others #43, 49, 51
 - Attend to precision #50
 - Look for and express regularity in repeated reasoning #52–54

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UNIT 5 – FACTORING POLYNOMIALS, QUADRATIC FUNCTIONS, AND EQUATIONS

- Section 7.6, Choosing a Factoring Method
 - Make sense of problems and persevere in solving them # 42, 48, 59, 64
 - Construct viable arguments and critique the reasoning of others #43, 49, 51
 - Attend to precision #50
 - Look for and express regularity in repeated reasoning #52–54

Ch 8: Sections 8.6 - 8.7, 8.9

Mathematical practices:

- Section 8.6, Solving Quadratic Equations by Factoring
 - Make sense of problems and persevere in solving them #19, 32, 40–44, 47, 59–61
 - Construct viable arguments and critique the reasoning of others #39, 45–46
- Section 8.7, Solving Quadratic Equations by Using Square Roots
 - AM Make sense of problems and persevere in solving them #16, 35, 40, 42, 46, 60
 - Reason abstractly and quantitatively #39, 44–45
 - Construct viable arguments and critique the reasoning of others #43, 47, 53
 - Attend to precision #41
- Section 8.9, The Quadratic Formula and the Discriminant
 - Make sense of problems and persevere in solving them. Exercises 23, 39, 53, 56, 60–61
 - Construct viable arguments and critique the reasoning of others #54–55

Vocabulary

Axis of symmetry
Greatest common factor
Maximum
Minimum

Parabola
Prime factorization
Quadratic equation

Quadratic function
Vertex
Zero of a function

KPBSD MATH CURRICULUM
ALGEBRA I
UNIT 6 – EXPONENTS AND POLYNOMIALS

Desired Results

Priority Standards	Transfer	
<p>N.RN.1. 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. <i>For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3) \cdot 3}$ to hold, so $(5^{1/3})^3$ must equal 5.</i></p> <p>N.RN.2. – KPBSD Added - Rewrite expressions involving radicals and rational exponents using the properties of exponents. <i>For example, Write equivalent representations that utilize both positive and negative exponents.</i></p> <p>A.APR.1. Add, subtract, and multiply polynomials. Understand that polynomials form a system similar to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication.</p> <p>A.SSE.1b. Interpret expressions that represent a quantity in terms of its context.</p> <p style="padding-left: 20px;">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.</p> <p>F.LE.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.</p> <p style="padding-left: 20px;">a. Show that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.</p>	<p>Students will be able to independently use their learning to...</p> <p>Use exponents to describe numbers.</p> <p>Perform operations with polynomials.</p>	
	Meaning	
	ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS
	<p>Students will understand that...</p> <ul style="list-style-type: none"> • The polynomial operations of addition, subtraction, and multiplication. • How to apply properties of exponents to simplify radicals. 	<p>Students will keep considering...</p> <ul style="list-style-type: none"> • How do I classify polynomials? • How can I use the polynomial operations of addition, subtraction, and multiplication to change the form of a polynomial? • How does finding greatest common factors help in factoring polynomials? • How do the properties of exponents apply to radical expressions?
Acquisition		
<p>Students will know...</p> <ul style="list-style-type: none"> • Properties of exponents. • Application of polynomials in real-world situations. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> • I can evaluate expressions containing zero and integer exponents. • I can simplify expressions containing zero and integer exponents. • I can evaluate and simplify expressions containing rational exponents • I can classify polynomials and write polynomials in standard form. • I can evaluate polynomial expressions. • I can add and subtract polynomials. • I can multiply polynomials. • I can find special products of binomials. 	

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UNIT 6 – EXPONENTS AND POLYNOMIALS**

<p>b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</p> <p>c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</p> <p>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.</p>		
Evidence		
Evaluative Criteria	Assessment Evidence	
<p>Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...</p>	<p>PERFORMANCE TASK(S): To be determined</p>	
Learning Plan		
<p>Ch 6: Sections 6.1 - 6.6 Mathematical practices:</p> <ul style="list-style-type: none"> ● Section 6.1, Integer Exponents <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #77, 94 ○ Construct viable arguments and critique the reasoning of others #66, 84–85 ○ Look for and make use of structure #101 ● Section 6.2, Rational Exponents <ul style="list-style-type: none"> ○ AM Make sense of problems and persevere in solving them #22, 51, 80–81, 85 ○ Reason abstractly and quantitatively #97 ○ Construct viable arguments and critique the reasoning of other #82–84, 86 		

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UNIT 6 – EXPONENTS AND POLYNOMIALS

- Look for and make use of structure #60–67, 91–96
- Section 6.3, Polynomials
 - Make sense of problems and persevere in solving them #26, 58, 63, 74, 79
 - Reason abstractly and quantitatively #59–62
 - Construct viable arguments and critique the reasoning of others #73, 75
 - Look for and make use of structure #80
- Section 6.4, Adding and Subtracting Polynomials
 - AM Make sense of problems and persevere in solving them #15, 33–34, 43, 53, 56–57
 - Reason abstractly and quantitatively #58–62
 - Construct viable arguments and critique the reasoning of others #44–45, 52
 - Look for and make use of structure #46–51
- Section 6.5, Multiplying Polynomials
 - Make sense of problems and persevere in solving them #25, 62–64, 69, 82, 84, 94
 - Reason abstractly and quantitatively #66–68, 93
 - Construct viable arguments and critique the reasoning of others #83, 85
 - Attend to precision #86
 - Look for and make use of structure #65, 96–97
- Section 6.6, Special Products of Binomials
 - Make sense of problems and persevere in solving them #39–40, 61, 64
 - Construct viable arguments and critique the reasoning of others #62–63, 65–66
 - Look for and make use of structure #53–60, 74

Vocabulary

Binomial
Closure
Degree of a monomial
Degree of a polynomial
Element

Leading coefficient
Monomial
Perfect-square trinomial
Polynomial

Set
Standard form of a polynomial
Subset
Trinomial

KPBSD MATH CURRICULUM
ALGEBRA I
UNIT 7 – DATA ANALYSIS

Desired Results

<p style="text-align: center;">Priority Standards</p> <p>S.CP.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).</p> <p>S.ID.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p>S.ID.2. 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.</p> <p>S.ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). <i>For example, Justify why median price of homes or income is used instead of the mean.</i></p> <p>S.ID.5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.</p> <p>S.ID.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.</p> <p>S.ID.9. Distinguish between correlation and causation.</p>	Transfer	
	<p>Students will be able to independently use their learning to...</p> <p>Organize and display data to answer questions.</p> <p>Use descriptive statistics to summarize data sets.</p> <p>Understand experimental probability and theoretical probability.</p> <p>Use probability to make appropriate predictions.</p>	
	Meaning	
	<p style="text-align: center;">ENDURING UNDERSTANDINGS</p> <p>Students will understand that...</p> <ul style="list-style-type: none"> Measures of central tendency (mean, median, and mode) to best describe a data set. Statistical events can be described as subsets of a sample space. 	<p style="text-align: center;">ESSENTIAL QUESTIONS</p> <p>Students will keep considering...</p> <ul style="list-style-type: none"> How do I explain the differences between data sets? How can data be represented using dot plots, histograms, and box plots? How can data distributions be used appropriately to compare and contrast sets of data? How can technology support but not replace our mathematics skills and understanding? How can conclusions be made and supported or not be supported? How do I decide if data reliable to use?
Acquisition		
<p>Students will know...</p> <ul style="list-style-type: none"> Real-world applications of data analysis and probability. 	<p>Students will be skilled at...</p> <ul style="list-style-type: none"> I can organize data in tables and graphs. I can choose a table or graph to display. I can create stem-and-leaf plots. I can create frequency tables and histograms. I can describe the central tendency of a data set. I can create and interpret box-and-whisker plots. 	

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UNIT 7 – DATA ANALYSIS**

		<ul style="list-style-type: none"> • I can recognize misleading graphs and statistics. • I can determine the experimental probability of an event. • I can use experimental probability to make predictions. • I can determine the theoretical probabilities of an event. • I can convert between probabilities and odds. • I can find the probability of independent and dependent events.
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Evidence

Evaluative Criteria	Assessment Evidence
Rubrics Course Assignments Performance Tasks Teacher made assessments Observation Journals and Self-Reflection Technology-Based Assessments Other...	PERFORMANCE TASK(S): To be determined

Learning Plan

<p>Ch 10: Sections 10.1 - 10.6</p> <p>Mathematical practices:</p> <ul style="list-style-type: none"> • Section 10.1, Organizing and Displaying Data <ul style="list-style-type: none"> ○ Reason abstractly and quantitatively #40–42 ○ Construct viable arguments and critique the reasoning of others #7, 12, 16, 29, 34, 36 ○ Use appropriate tools strategically #29–33 ○ Attend to precision #3, 8, 11, 17–18 • Section 10.2, Frequency and Histograms <ul style="list-style-type: none"> ○ Make sense of problems and persevere in solving them #8–9, 20–21, 24–26, 41–43, 48–49, 51–52, 60

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UNIT 7 – DATA ANALYSIS

- Reason abstractly and quantitatively #6–7, 18–19, 36–40
- Construct viable arguments and critique the reasoning of others #50, 53
- Model with mathematics #59
- Attend to precision #35
- Section 10.3, Data Distributions
 - Make sense of problems and persevere in solving them #8–9, 20–21, 24–26, 41–43, 48–49, 51–52, 60
 - Reason abstractly and quantitatively #6–7, 18–19, 36–40
 - Construct viable arguments and critique the reasoning of others #50, 53
 - Model with mathematics #59
 - Attend to precision #35
- Section 10.4, Misleading Graphs and Statistics
 - Make sense of problems and persevere in solving them #2–11, 17-18
 - Construct viable arguments and critique the reasoning of others #12–14
- Section 10.5, Experimental Probability
 - Make sense of problems and persevere in solving them #11, 21–23, 28, 32, 37
 - Reason abstractly and quantitatively #26
 - Construct viable arguments and critique the reasoning of others #24–25
 - Attend to precision #27
- Section 10.6, Theoretical Probability
 - Make sense of problems and persevere in solving them #32, 34, 38
 - Construct viable arguments and critique the reasoning of others #29–31, 33

Vocabulary

Dependent events
Experimental probability
Frequency

Independent events
Median
Outlier

Probability
Quartile
Theoretical probability