Algebra 2 Curriculum

Unit 0 Introduction

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
	Course Preview Incidentals, Books, Seating Charts, Class Rules and Procedures Resources: Suggested Text Pearson -Algebra 2						
5 Days	Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.	How do you write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities?	Algebraic properties processes and representations.	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Solving Equations (Formulas) for a Variable Objective: SWBA to solve an equation/ formula for an indicated variable. **See Algebra 2 AAEC**	Formula Variables Inverse operations	A2.1.3.2 Describe or determine change. A2..1.3.2.2 Use algebraic processes to solve a formula for a given variable.
	Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.	How do you write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities?	Algebraic properties processes and representations.	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial	Writing Linear Equations Objectives: SWBA to write and equation given the slope and a point on the line. SWBA to write an equation of a line parallel or perpendicular to a given line Suggested Texts	Slope-intercept form Point-slope form Parallel Perpendicular	2.8.A2.C-Recognize, describe and generalize patterns using sequences and series to predict long-term outcomes A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.1-Analyze a set of data for the existence of a pattern and represent the pattern with a rule

				equation to each representation.	Pearson Algebra 2 (2012) Section 2-4 (Pg. 74-80) Glencoe Algebra 2 (2010) Section 2-4 (pgs 83-89)		algebraically and/or graphically.
	Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.	How do you write, solve, graph, and interpret linear equations and inequalities to model relationships between quantities?	Algebraic properties processes and representations.	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Determining Change Objective: SWBA to describe how the change in one variable relates to a change I the second variable. **See Algebra 2 AAEC**	Change	A2.1.3.2 Describe or determine change. A2..1.3.2.1 Determine how a change in one variable related to a change in the second variable.
	Bivariate data can be modeled with mathematical functions that approximate the data well and help us make predictions based on the data.	How do you use lines and curves of best fit to model real world situations and to provide predictions based on a sample?	Polynomial functions and equations	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Scatter Plots and Lines of Regression Objectives: SWBA to write linear equations that model real-world data. SWBA to make predictions from linear models. Suggested Texts Pearson Algebra 2 (2012) Section 2-5 (Pg.92-98) Glencoe Algebra 2 (2010) Section 2-5 (pgs 92-98)	Bivariate data Correlation Scatter plot Dot plot Positive correlation Negative correlation Line of fit Prediction equation	2.6.A2.C-Construct a line of best fit and calculate its equation for linear and non linear two variable data. 2.6.A2.E-Make predictions based on lines of best fit or draw conclusions on the value of a variable in a population based on the results of a sample A2.2.3.1-Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions. A2.2.3.1.1-Draw, identify, find, interpret, and/or write an equation for a regression model (lines

						Regression line Correlation coefficient	and curves of best fit) for a scatter plot. A2.2.3.1.2-Make predictions using the equations or graphs of regression models (lines and curves of best fit) of scatter plots.

Unit 1 Quadratic Functions and Equations

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
24 days	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How do quadratic equations and their graphs and/or tables help us interpret events that occur in the world around us?	Quadratic functions and equations.	Represent a quadratic function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated quadratic equation to each representation.	Quadratic Functions and Relations/ Graphing Quadratic Functions Objectives: SWBA to graph quadratic functions . SWBA to find and interpret the maximum and minimum value of a quadratic function Suggested Texts Pearson Algebra 2 (2012) Section 4-1 (Pg. 194-201) Glencoe Algebra 2 (2010) Chapter 5 -Section 5-1 (pgs 249-257)	Quadratic function Quadratic term Linear term Constant term Parabola Axis of symmetry Vertex Maximum value Minimum value	2.8.A2.B Evaluate and simplify algebraic expressions, for example: products/quotients of polynomials, logarithmic expressions and complex fractions; and solve and graph linear, quadratic, exponential, and logarithmic equations and inequalities, and solve and graph systems of equations and inequalities. 2.8.A2.D Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential and logarithmic)

					Section 5-7 (pgs 305-310)		2.8.A2.E Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situation. 2.11.A2.A Determine the maximum and minimum values of a function over a specific interval. A2.2.1 Patterns, Relations and Functions A2.2.2 Applications of Functions A2.2.1.1 Analyze and/or use patterns or relations. A2.2.2.1 Create, interpret, and/or use polynomial exponential and/or logarithmic functions and their equations, graphs or tables. A2.2.1.1.4 Identify the characteristics of an exponential, quadratic, or polynomial function. A2.2.2.1.3 Determine, use and/or interpret maximum and minimum values over specified interval of a graph of a polynomial,

							exponential, logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph table and equation).
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How do quadratic equations and their graphs and/or tables help us interpret events that occur in the world around us?	Quadratic functions and equations.	Represent a quadratic function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated quadratic equation to each representation.	Solve Quadratic Equations by Graphing Objectives: SWBA to solve quadratic equations by graphing. SWBA to estimate solutions of quadratic equations by graphing Suggested Text Pearson Algebra 2 (2012) Section 4-5 (Pg. 226-231) Glencoe Algebra 2 (2010) Section 5-2 (pgs 259-266) .	Quadratic equation Standard form Root Zero	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear

							equations using various methods. A2.1.3.1.1-Write and/or solve quadratic equations (including factoring and using the Quadratic Formula). A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics).
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How do quadratic equations and their graphs and/or tables help us interpret events that occur in the world around us?	Quadratic functions and equations.	Represent a quadratic function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated quadratic equation to each representation.	Solving Quadratic Equations by Factoring Objectives: SWBA to write quadratic equations in intercept form. SWBA to solve quadratic equations by factoring. Suggested Texts Pearson Algebra 2 (2012) Section 4-5 (Pg. 226-231) Glencoe Algebra 2 (2010) Section 5-3 (pgs 268-275)	Factored form FOIL method Zero of the Function Zero-Product Property	2.1.A2.B-Use factoring to create equivalent forms of polynomials 2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the

							results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.2.2-Simplify expressions involving polynomials. A2.1.2.2.1-Factor algebraic expressions, including difference of squares and trinomials. Note: Trinomials limited to the form ax2+bx+c where a is not equal to 0. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.1-Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How do quadratic equations and their graphs and/or tables help us interpret events that occur in the world around us?	Quadratic functions and equations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Completing the Square Suggested Text-Glencoe Algebra 2 (2010) Section 5-5 (pgs 284-290) Pearson Algebra 2 (2012) Section 4-6 (Pg. 233-239) Objectives: SWBA to solve quadratics by completing the square.	Completing the square	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations

					Duration:3 Days		and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.1-Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How do quadratic equations and their graphs and/or tables help us interpret events that occur in the world around us?	Quadratic functions and equations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Completing the Square Objectives: SWBA to solve quadratics by completing the square Suggested Text-Glencoe Algebra 2 (2010) Section 5-5 (pgs 284-290) Pearson Algebra 2 (2012) Section 4-6 (Pg. 233-239) .	Completing the square	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving

							equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.1-Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Quadratic functions and equations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Quadratic Formula and the Discriminant Objectives: SWBA to solve quadratic equations by using the Quadratic Formula. SWBA to use the discriminant to determine the number and the type of roots of a quadratic equation. Suggested Text-Glencoe Algebra 2 (2010) Section 5-6 (pgs 292-300) Pearson Algebra 2 (2012) Section 4-7 (Pg. 240-247)	Quadratic Formula Discriminant	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the

							model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.1-Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Quadratic functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Parent Functions and Transformations Objectives: SWBA to identify and use parent functions. SWBA to describe transformations of functions. Suggested Text- Glencoe Algebra 2 (2010) Section 2-7 (pgs 109-116) Pearson Algebra 2 (2012) Section 2-6 (Pg. 99-106)	Bivariate data Scatter plot Dot plot Positive correlation Negative correlation Line of fit Prediction equation Regression line Correlation coefficient	2.3.A2.E-Describe how a change in the value of one variable in formulas affects the value of the measurement. 2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.4-Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease,

							intercepts, zeros, and asymptotes). A2.2.2.2-Describe and/or determine families of functions. A2.2.2.2.1-Identify or describe the effect of changing parameters within a family of functions
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Quadratic functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Transformations with Quadratic Functions Objectives: SWBA to write a quadratic function in vertex form. SWBA to transform graphs of quadratic functions in vertex form Suggested Text Glencoe Algebra 2 (2010) Section 5-7 (pgs 305-310) . Day 33, 34, 35	Vertex form	2.3.A2.E-Describe how a change in the value of one variable in formulas affects the value of the measurement. 2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.4-Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes). A2.2.2.2-Describe and/or determine families of functions. A2.2.2.2.1-Identify or describe the effect of

							changing parameters within a family of functions
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Quadratic functions and equations.	Represent a quadratic function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated quadratic equation to each representation.	Quadratic Functions and Relations/ Graphing Quadratic Functions Suggested Text-Glencoe Algebra 2 (2010) Chapter 5 -Section 5-1 (pgs 249-257) Section 5-7 (pgs 305-310) Pearson Algebra 2 (2012) Section 4-1 (Pg. 194-201) Objectives: SWBA to write a quadratic function in vertex form. SWBA to transform graphs of quadratic functions in vertex form	Quadratic function Quadratic term Linear term Constant term Parabola Axis of symmetry Vertex Maximum value Minimum value	2.8.A2.B Evaluate and simplify algebraic expressions, for example: products/quotients of polynomials, logarithmic expressions and complex fractions; and solve and graph linear, quadratic, exponential, and logarithmic equations and inequalities, and solve and graph systems of equations and inequalities. 2.8.A2.D Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential and logarithmic) 2.8.A2.E Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situation. 2.11.A2.A Determine

							the maximum and minimum values of a function over a specific interval. A2.2.1 Patterns, Relations and Functions A2.2.2 Applications of Functions A2.2.1.1 Analyze and/or use patterns or relations. A2.2.2.1 Create, interpret, and/or use polynomial exponential and/or logarithmic functions and their equations, graphs or tables. A2.2.1.1.4 Identify the characteristics of an exponential, quadratic, or polynomial function. A2.2.2.1.3 Determine, use and/or interpret maximum and minimum values over specified interval of a graph of a polynomial, exponential, logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph table and equation).
	Review Unit 1 Common Assessment Quadratic Functions and Equations Duration: 1 Day						

	Test Unit 1 Common Assessment Quadratic Functions and Equations Duration: 1 Day						
Unit 2 Complex Numbers							
Estimated Unit Time Frames	**Big Ideas**	**Essential Questions**	**Concepts (Know)**	**Competencies (Do)**	**Lessons/ Suggested Resources**	**Vocabulary**	**Standards/ Eligible Content**
10 Days	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Complex Numbers Objectives: SWBA to perform operations on pure imaginary numbers. Suggested Text-Glencoe Algebra 2 (2010) Section 5-4 (pgs 276-282) Pearson Algebra 2 (2012) Section 4-8 (Pg. 248-255)	Imaginary Unit Pure imaginary number Complex number Complex conjugates	2.1.A2.A-Model and compare values of complex numbers. 2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four basic operations and operations of powers, opposites, conjugates, and absolute values. A2.1.1.1-Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents). A2.1.1.1.1-Simplify/write square roots in terms of i A2.1.1.1.2-Simplify/evaluate expressions involving powers of i . A2.1.1.2-Apply the order of operations in computation and in problem solving situations. A2.1.1.2.1-Add and subtract complex numbers. A2.1.1.2.2-Multiply

							and divide complex numbers.
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Complex Numbers Objectives: SWBA to perform operations on Complex Numbers Suggested Texts Glencoe Algebra 2 (2010) Section 5-4 (pgs 276-282) Pearson Algebra 2 (2012) Section 4-8 (Pg. 248-255)	Imaginary Unit Pure imaginary number Complex number Complex conjugates	2.1.A2.A-Model and compare values of complex numbers. 2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four basic operations and operations of powers, opposites, conjugates, and absolute values. A2.1.1.1-Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents). A2.1.1.1.1-Simplify/write square roots in terms of i A2.1.1.1.2-Simplify/evaluate expressions involving powers of i . A2.1.1.2-Apply the order of operations in computation and in problem solving situations. A2.1.1.2.1-Add and subtract complex numbers. A2.1.1.2.2-Multiply and divide complex numbers.
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply	Complex Numbers Suggested Text-Glencoe Algebra 2 (2010) Section 5-4 (pgs 276-282) Pearson Algebra 2 (2012) Section 4-8 (Pg. 248-255)	Imaginary Unit Pure imaginary number	2.1.A2.A-Model and compare values of complex numbers. 2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four basic operations and operations of powers,

	structures in many equivalent forms.			them to solve real world problems.	Objectives: SWBA to solve equations with Complex Numbers. Duration: 3 Days	Complex number Complex conjugates	opposites, conjugates, and absolute values. A2.1.1.1-Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents). A2.1.1.1.1-Simplify/write square roots in terms of i A2.1.1.1.2-Simplify/evaluate expressions involving powers of i . A2.1.1.2-Apply the order of operations in computation and in problem solving situations. A2.1.1.2.1-Add and subtract complex numbers. A2.1.1.2.2-Multiply and divide complex numbers.
	Review Unit 2 Common Assessment Complex Numbers Duration: 1 Day						
	Test Unit 2 Common Assessment Complex Numbers Duration: 1 Day						

Unit 3 Polynomials and Polynomial Functions

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
24 Days	Numbers, measures, expressions,	How can we show that algebraic properties and processes are extensions of	Polynomial functions and equations	Extend algebraic properties and processes to	Operations with Polynomials	Simplify	2.1.A2.D-Use exponential notation to represent any rational

	equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?		quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Objectives: SWBA to multiply, divide, and simplify monomials and expressions involving powers. SWBA to add, subtract and multiply polynomials. Suggested Text Glencoe Algebra 2 (2010)- Chapter 6 Section 6-1 (pgs 333-339) Glencoe Algebra 2 (2012) Chapter 5 Section 5-1 (pgs303-310) Pearson Algebra 2 (2012) Pg. 978	Degree of a polynomial	number. 2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four basic operations and operations of powers, opposites, conjugates, and absolute values. A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.1-Use exponential expressions to represent rational numbers. A2.1.2.1.2-Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers exponents should not exceed power of 10). A2.1.2.1.3-Simplify/evaluate expressions involving multiplying with exponents, powers of powers
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply	Dividing Polynomials Objectives: SWBA to divide polynomials.	Synthetic division	2.1.A2.D-Use exponential notation to represent any rational number. A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve

	structures in many equivalent forms.			them to solve real world problems.	SWBA to divide polynomials using synthetic division. Suggested Text-Glencoe Algebra 2 (2010) Section 6-2 (pgs 341-347) Glencoe: Algebra 2 (2012) Section 5-2 (pgs 311-319) Pearson Algebra 2 (2012) Section 5-4 (Pg. 303-310)		problems. A2.1.2.1.1-Use exponential expressions to represent rational numbers. A2.1.2.1.3-Simplify/evaluate expressions involving multiplying with exponents, powers of powers and powers of products. Note: Limit to rational exponents.
	Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Polynomial Functions Objectives: SWBA to classify polynomial functions SWBA to evaluate polynomial functions. SWBA to identify general shapes of graph of polynomial functions. Suggested Text Glencoe Algebra 2 (2010) Section 6-3 (pgs 348-355) Pearson Algebra 2 Section5-1 (Pg. 280-287)	Polynomial in one variable Monomial Degree of the monomial Degree of the polynomial Leading coefficient Polynomial function Power function End behavior Quartic function Turning point	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or

						Standard form of a polynomial function	logarithmic functions and their equations, graphs, or tables. A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics). A2.2.2.1.4-Translate from one representation of a function to another (graph, table, and equation).
	Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Analyzing Graphs of Polynomial Functions Objectives: SWBA to graph polynomial functions and locate their zeros. SWBA to find the relative maxima and minima of polynomial functions. Suggested Text-Glencoe Algebra 2 (2010) Section 6-4 (pgs 357-364) Pearson Algebra 2 Section5-2 (Pg. 288-295)	Relative maximum Relative minimum Extrema Multiplicity Multiple zero Factor Theorem	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics).
	There are some mathematical relationships that are always true and these	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we	Algebraic properties processes and representations	Extend algebraic properties and processes to quadratic exponential and	Factoring Polynomials Objectives:	Monomial Binomial Trinomial	A2.1.2 Non-Linear Expressions A2.1.2.2.1 Factor algebraic expressions

	relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	use algebraic properties and processes to solve problems?		polynomial expressions and equations and to matrices, and apply them to solve real world problems.	SWBA to factor polynomials by using various techniques Suggested Text-Glencoe Algebra 2 (2010) Section 0-3 (pgs P7-P8) Glencoe: Algebra 2 (2012) Section 0-3 (pgs P7-P8) Pearson Algebra 2 (2012) Section 5-3 (Pg. 296-302) Objectives: SWBA to factor polynomials by using various techniques. Duration: 3 Days	Difference of two squares Perfect Square Trinomial	including the difference of two squares and trinomials limited to the form ax^2 + bx +c where a is not equal to zero.
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Solving Polynomial Equations Suggested Text-Glencoe Algebra 2 (2010) Section 6-5 (pgs 368-375) Objectives: SWBA to factor polynomials. SWBA to solve polynomial equations by factoring.	Prime polynomials Quadratic form	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. A2.2.2.1-Create, interpret, and/or use

							polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics). A2.2.2.1.4-Translate from one representation of a function to another (graph, table, and equation).
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties, processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	The Remainder and Factor Theorems Objectives: SWBA to divide polynomials using long division. SWBA to divide polynomials using synthetic division. SWBA to evaluate functions using synthetic substitution. SWBA to determine whether a binomial is a factor of a polynomial using synthetic substitution. Suggested Text Glencoe Algebra 2 (2010) Section 6-6 (pgs 377-382)	Prime polynomials Quadratic form Synthetic Division Remainder Theorem	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables.

					Pearson Algebra 2 Section5-4 (Pg. 303-310)		A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics). A2.2.2.1.4-Translate from one representation of a function to another (graph, table, and equation).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties, processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Theorems about Roots and Zeros of Polynomial Equations. Objectives: SWBA to determine the number and the type of roots for a polynomial function. SWBA to find the zeros of a polynomial function. Suggested Text-Glencoe Algebra 2 (2010) Section 6-7 (pgs 383-390) Pearson Algebra 2 Section5-5 (Pg. 312-318)	Roots Zeros Descartes' Rule of Signs	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including

							quadratics). A2.2.2.1.4-Translate from one representation of a function to another (graph, table, and equation).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties, processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Rational Zero Theorem Objectives: SWBA to identify possible rational zeros of a polynomial function . SWBA to find all the rational zeros of a polynomial function. SWBA to solve equations using the Rational Root Theorem. SWBA to use the conjugate Root Theorem. Suggested Text- Glencoe Algebra 2 (2010) Section 6-8 (pgs 391-399) Pearson Algebra 2 Section5-5 (Pg. 312-318)	Roots Zeros Rational Root Theorem Conjugate Root Theorem Descartes' Rule of Signs	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.1-Create, interpret, and/or use the equation, graph, or table of a polynomial function (including quadratics). A2.2.2.1.4-Translate from one representation of a function to another

							(graph, table, and equation).
	Review Unit 3 Common Assessment Polynomials and Polynomial Functions Duration: 1 day						
	Test Unit 3 Common Assessment Polynomials and Polynomial Functions Duration: 1 day						
Unit 4 Inverses and Radical Functions and Relations							
Estimated Unit Time Frames	**Big Ideas**	**Essential Questions**	**Concepts (Know)**	**Competencies (Do)**	**Lessons/ Suggested Resources**	**Vocabulary**	**Standards/ Eligible Content**
18 Days	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Operations on Functions Objectives: SWBA to find the sum, difference, product and quotient of functions. SWBA to find the composition of two functions. Suggested Text- Glencoe Algebra 2 (2010) Section 7-1 Operations on Functions (pgs 409-416) Pearson Algebra 2 Section 6-6 (Pg. 398-404)	Composition of functions	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.3-Determine the domain, range, or inverse of a relation.
	Patterns exhibit relationships that can be extended,	What are the advantages/disadvantages of the various methods to represent exponential	Polynomial functions and equations	Represent exponential functions in multiple ways,	Inverse Functions and Relations Objectives:	Inverse relation Inverse function	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain,

	described, and generalized.	functions (table, graph, equation) and how do we choose the most appropriate representation?		including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	SWBA to find the inverse of a function or a relation. SWBA to determine if two functions or relations are inverses. Suggested Text- Glencoe Algebra 2 (2010) Section 7-2 (pgs 417-422) Pearson Algebra 2 Section 6-7 (Pg. 405-412)	One-to-One function	range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.3-Determine the domain, range, or inverse of a relation.
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Polynomial functions and equations	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Square Root Functions and Inequalities Objectives: SWBA to graph and analyze square root functions. SWBA to graph square root inequalities. Suggested Text- Glencoe Algebra 2 (2010) Section 7-3 (pgs 424-430) Pearson Algebra 2 Section 6-8 (Pg. 414-420)	Square root function Radical functions Square root inequality	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.3-Determine the domain, range, or inverse of a relation.
	Numbers, measures, expressions, equations, and inequalities can	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we	Algebraic properties, processes and representations.	Extend algebraic properties and processes to quadratic exponential and	nth Roots Objectives:	Nth root Radical sign	2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four basic operations and

	represent mathematical situations and structures in many equivalent forms.	use algebraic properties and processes to solve problems?		polynomial expressions and equations and to matrices, and apply them to solve real world problems.	SWBA to simplify radicals. SWBA to use a calculator to estimate radicals. Suggested Text-Glencoe Algebra 2 (2010) Section 7-4 (pgs 431-436) Pearson Algebra 2 (2012) Section 6-2 (Pg. 367-373)	Index Radicand Principal root	operations of powers, opposites, conjugates, and absolute values. A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.2-Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers exponents should not exceed power of 10).
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Algebraic properties, processes and representations.	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Operations with Radical Expressions Objectives: SWBA to simplify radical expressions . SWBA to add, subtract multiply and divide radical expressions. Suggested Text- Glencoe Algebra 2 (2010) Section 7-5 (pgs 439-445) Pearson Algebra 2 (2012) Section 6-2 (Pg. 303-310)	Rationalizing the denominator Like radical expressions Conjugate	2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four basic operations and operations of powers, opposites, conjugates, and absolute values. A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.2-Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers exponents should not exceed power of 10).
	Numbers, measures, expressions, equations, and	How can we show that algebraic properties and processes are extensions of arithmetic properties and	Algebraic properties, processes and representations.	Extend algebraic properties and processes to quadratic	Rational Exponents Objectives:	Rational Exponents	2.2.A2.C-Evaluate numerical expressions of complex numbers that include the four

	inequalities can represent mathematical situations and structures in many equivalent forms.	processes, and how can we use algebraic properties and processes to solve problems?		exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	SWBA to write expressions with rational exponents in radical form. SWBA to write expressions in radical form with rational exponents. SWBA to simplify expressions in exponential or radical form. Suggested Text-Glencoe Algebra 2 (2010) Section 7-6 (pgs 446-452) Pearson Algebra 2 (2012) Section 6-4 (Pg. 381-388)		basic operations and operations of powers, opposites, conjugates, and absolute values. A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.2-Simplify/evaluate expressions involving positive and negative exponents and/or roots (may contain all types of real numbers exponents should not exceed power of 10).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Solving Radical Equations and Inequalities Objectives: SWBA to solve equations containing radicals. SWBA to solve inequalities containing radicals. Suggested Text-Glencoe Algebra 2 (2010) Section 7-7 (pgs 453-459) Pearson Algebra 2 (2012) Section 6-5 (Pg. 390-397)	Radical equation Extraneous solution Radical inequality	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the

							results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.2-Solve equations involving rational and/or radical expressions
	Review Unit 4 Common Assessment Inverses and Radical Functions and Relations Duration: 1 day						
	Test Unit 4 Common Assessment Inverses and Radical Functions and Relations Duration: 1 day						

Unit 5 Exponential and Logarithmic Functions and Relations

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
27 Days	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations;	Exploring Exponential Models Graphing Exponential Functions Objectives: SWBA to graph exponential growth functions	Exponential Function Exponential Growth Asymptote Growth factor	2.1.A2.F-Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.B-Evaluate and

	of expressions and solving equations and inequalities.			relate the growth/decay rate of the associated exponential equation to each representation.	. SWBA to graph exponential decay functions. Suggested Text- Glencoe Algebra 2 (2010) Section 8-1 (pgs 475-482) Pearson Algebra 2 Section7-1 (Pg. 434-441)	Exponential decay Decay factor	simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.4-Simplify or evaluate expressions involving logarithms and exponents (e.g., log28 = 3 or log42 = Â½). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.3-Determine the domain, range, or inverse of a relation. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.2-Create, interpret, and/or use the

							equation, graph, or table of an exponential or logarithmic function (including common and natural logarithms). A2.1.3.1 Write and/or solve non-linear equations using various methods A2.1.3.1.4 Write, solve and or apply linear or exponential growth of decay (including problem situations).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Solving Exponential Equations and Inequalities Objectives: SWBA to solve exponential equations. SWBA to solve exponential inequalities Suggested Text-Glencoe Algebra 2 (2010) Section 8-2 (pgs 485-491) Pearson Algebra 2 (2012) Section 7-5 (Pg.469-475) .	Exponential Equation Exponential Inequality Natural base exponential function Continuously compounded interest	2.1.A2.F-Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the

							model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.3-Write and/or solve a simple exponential or logarithmic equation (including common and natural logarithms).
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Logarithm and Logarithmic Functions Objectives: SWBA to write and evaluate logarithmic expressions. SWBA to graph logarithmic functions. Suggested Text Glencoe Algebra 2 (2010) Section 8-3 (pgs 492-499) Pearson Algebra 2 (2012) Section7-3 (Pg. 451-458)	Logarithm Logarithmic function Common logarithm Logarithmic scale	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.2-Create, interpret, and/or use the equation, graph, or table of an exponential or logarithmic function

							(including common and natural logarithms). A2.2.2.1.4-Translate from one representation of a function to another (graph, table, and equation).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Solving Logarithmic Equations and Inequalities Objectives: SWBA to solving Logarithmic Equations. SWBA to solving Logarithmic Inequalities. Suggested Text- Glencoe Algebra 2 (2010) Section 8-4 (pgs. 503-507) Pearson Algebra 2 (2012) Section 7-5 (Pg. 469-476) .	Logarithmic equation Logarithmic Inequality	2.1.A2.F-Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.3-Write

							and/or solve a simple exponential or logarithmic equation (including common and natural logarithms).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Properties of Logarithms Objectives: SWBA to use properties of logarithms to simplify, expand and evaluate logarithmic expressions. SWBA to solve logarithmic Equations using the properties of logarithms. Suggested Text Glencoe Algebra 2 (2010) Section 8-5 (pgs 509-515) Pearson Algebra 2 (2012) Section 7-4 (Pg. 462-488) Objectives: SWBA to use properties of logarithms to simplify, expand and evaluate logarithmic expressions.	Change of Base Formula	2.1.A2.F-Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.3-Write and/or solve a simple exponential or logarithmic equation

							(including common and natural logarithms).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Common Logarithms Objectives: SWBA to solve exponential equations and inequalities using common logarithms. SWBA to evaluate logarithmic expressions using the Change of Base Formula. Suggested Text-Glencoe Algebra 2 (2010) Section 8-6 (pgs 516-522) Pearson Algebra 2 (2012) Section7-3 (Pg. 451-458)	Common logarithm Change of Base Formula	2.1.A2.F-Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.4-Simplify or evaluate expressions involving logarithms and exponents (e.g., log28 = 3 or log42 = Â½). A2.2.2.1.2-Create, interpret, and/or use the equation, graph, or table of an exponential or logarithmic function (including common and natural logarithms).
	There are some mathematical relationships that	What are the advantages/disadvantages of the various methods to	Exponential functions and equations.	Represent exponential functions in	Base e and Natural Logarithms	Natural base, e	2.1.A2.F-Understand the concepts of exponential and

	are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?		multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Objectives: SWBA to evaluate expressions involving the natural base and natural logarithms. SWBA to solve exponential equations using natural logarithms Suggested Text Glencoe Algebra 2 (2010) Section 8-7 (pgs 525-530) Pearson Algebra 2 Section7-6 (Pg. 478-483) .	Natural base exponential function Natural logarithm	logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.1.2.1-Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.4-Simplify or evaluate expressions involving logarithms and exponents (e.g., log28 = 3 or log42 = Â½). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.3-Determine the domain, range, or inverse of a relation. A2.2.2.1-Create,

							interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.2-Create, interpret, and/or use the equation, graph, or table of an exponential or logarithmic function (including common and natural logarithms).
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	What are the advantages/disadvantages of the various methods to represent exponential functions (table, graph, equation) and how do we choose the most appropriate representation?	Exponential functions and equations.	Represent exponential functions in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the growth/decay rate of the associated exponential equation to each representation.	Using Exponential and Logarithmic Functions Objectives: SWBA to solve problems involving exponential and logarithmic functions. SWBA to use logarithms to solve problems involving logistic growth. SWBA to graph exponential growth functions. SWBA to graph exponential decay functions. Suggested Text- Glencoe Algebra 2 (2010) Section 8-1 (pgs 475-482) Section 8-8 (pgs 533-539)	Natural base, e Natural base exponential function Natural logarithm	2.1.A2.F-Understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations. 2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.1.2.1-Use exponents, roots,

					Pearson Algebra 2 Section7-1 (Pg. 434-441) Section 7-2 (pg. 442-450)		and/or absolute values to represent equivalent forms or to solve problems. A2.1.2.1.4-Simplify or evaluate expressions involving logarithms and exponents (e.g., log28 = 3 or log42 = Â½). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.3-Determine the domain, range, or inverse of a relation. A2.2.2.1-Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. A2.2.2.1.2-Create, interpret, and/or use the equation, graph, or table of an exponential or logarithmic function (including common and natural logarithms). A2.1.3.1 Write and/or solve non-linear equations using various methods A2.1.3.1.4 Write, solve and or apply linear or exponential growth of decay (including problem situations).
	Review Unit 5 Common Assessment Exponential and Logarithmic Functions and Relations Duration: 1 day						

	Test Unit 5 Common Assessment Exponential and Logarithmic Functions and Relations Duration: 1 day

Unit 6 Rational Functions and Relations

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
17 Days	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Rational Expressions Objectives: SWBA to simplify rational expressions. SWBA to simplify Complex fractions. SWBA to multiply and divide rational expressions. Suggested Text- Glencoe Algebra 2 (2010) Section 9-1 (pgs 553-561) Pearson Algebra 2 Section 8-4 (Pg. 527-533)	Rational expression Simplest form Complex Fractions	2.1.A2.B-Use factoring to create equivalent forms of polynomials 2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model.

							A2.1.2.2-Simplify expressions involving polynomials. A2.1.2.2.1-Factor algebraic expressions, including difference of squares and trinomials. Note: Trinomials limited to the form ax2+bx+c where a is not equal to 0. A2.1.2.2.2-Simplify rational algebraic expressions. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.2-Solve equations involving rational and/or radical expressions
	Numbers, measures, expressions, equations, and inequalities can represent mathematical situations and structures in many equivalent forms.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Adding and Subtracting Rational Expressions Objectives: SWBA to determine the LCM of polynomials. SWBA to add and subtract rational expressions. SWBA to simplify complex fractions Suggested Text-Glencoe Algebra 2 (2010) Section 9-2 (pgs 562-568) Pearson Algebra 2 Section 8-5 (Pg. 534-541)	Rational Expressions Complex fraction	2.1.A2.B-Use factoring to create equivalent forms of polynomials A2.1.2.2-Simplify expressions involving polynomials. A2.1.2.2.2-Simplify rational algebraic expressions.

	Relations and functions are mathematical relationships that can be represented and analyzed using words, tables, graphs, and equations.	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Graphing Rational Functions Objectives: SWBA to graph rational functions with vertical and horizontal asymptotes. SWBA to graph rational functions with oblique asymptotes and point discontinuity. Suggested Text- Glencoe Algebra 2 (2010) Section 9-3 (pgs 569-575) Pearson Algebra 2 Section 8-3 (Pg. 515-523)	Rational function Vertical asymptote Horizontal asymptote Oblique asymptote Continuous Graph Discontinuous graph Point discontinuity Removable discontinuity Non-removable discontinuity	2.8.A2.D Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential and logarithmic). A2.2.1 Patterns, Relations and Functions A2.2.1.1 Analyze and/or use patterns or relations. A2.2.1.1.3 Determine the domain , range or inverse of a relation.
	There are some mathematical relationships that are always true and these relationships are used as the rules of arithmetic and algebra and are useful for writing equivalent forms of expressions and solving equations and inequalities.	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Solving Rational Equations and Inequalities Objectives: SWBA to solve rational equations SWBA to solve rational inequalities. Suggested Text-	Rational equation Weighted average Rational inequality	2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities. 2.8.A2.E-Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables,

					Glencoe Algebra 2 (2010) Section 9-6 (pgs 594-602) Pearson Algebra 2 Section 8-6 (Pg. 542-548) (Pgs 550-551)		systems of equations and inequalities, and functional relationships that model problem situations. 2.8.A2.F-Interpret the results of solving equations, inequalities, systems of equations, and systems of inequalities in the context of the situation that motivated the model. A2.1.3.1-Write and/or solve non-linear equations using various methods. A2.1.3.1.2-Solve equations involving rational and/or radical expressions
	Review Unit 6 Common Assessment Rational Functions and Relations Duration: 1 day						
	Test Unit 6 Common Assessment Rational Functions and Relations Duration: 1 day						
Unit 7 Families oF Functions							
Estimated Unit Time Frames	**Big Ideas**	**Essential Questions**	**Concepts (Know)**	**Competencies (Do)**	**Lessons/ Suggested Resources**	**Vocabulary**	**Standards/ Eligible Content**
17 Days	Families of functions exhibit properties and behaviors that can be recognized across representations.	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual	Relations and Functions Objectives: SWBA to analyze relations and functions.	One to one function Onto function Discrete relation	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions

	Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.			situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	SWBA to use equations of relations and functions Suggested Text Glencoe Algebra 2 (2010) Section 2-1 (pgs. 61-67) Pearson Algebra 2 (2012) Section 2-1 (Pg. 60-67)	Continuous relation Vertical line test Independent variable Dependent Variable Function notation	(linear, polynomial, rational, exponential, logarithmic). A2.2.1 Patterns, relations and functions A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.1-Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and /or graphically. A2.2.1.1.3- determine domain, range, or inverse of a relation.
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Linear Relations and Functions Objectives: SWBA to identify linear relations and functions. SWBA to write linear equations in standard form. Suggested Text Glencoe Algebra 2 (2010) Section 2-2 (Pgs. 69-74) Pearson Algebra 2 (2012) Section 2-3 (Pg. 74-80)	Linear relation Nonlinear relation Linear equation Linear function Standard form y-intercept x-intercept	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1 Patterns, relations and functions A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.1-Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and /or graphically.
	Families of functions exhibit properties and behaviors that can	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs,	Polynomial functions and equations	Represent a polynomial function in multiple ways, including	Parent Functions and Transformations Objectives:	Bivariate data	2.3.A2.E-Describe how a change in the value of one variable in formulas affects the

	be recognized across representations. Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.	equations, and contextual situations)?		tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	SWBA to identify and use parent functions . SWBA to describe transformations of functions. Suggested Text Glencoe Algebra 2 (2010) Section 2-7 (pgs 109-116) Pearson Algebra 2 (2012) Section 2-6 (Pg. 99-106)	Scatter plot Dot plot Positive correlation Negative correlation Line of fit Prediction equation Regression line Correlation coefficient	value of the measurement. 2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.4-Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increase/decrease, intercepts, zeros, and asymptotes). A2.2.2.2-Describe and/or determine families of functions. A2.2.2.2.1-Identify or describe the effect of changing parameters within a family of functions
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed, combined, and composed to	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated	Graphing Linear and Absolute Value Inequalities Objectives: SWBA to graph linear inequalities. SWBA to graph absolute value inequalities Suggested Text	Linear inequality Boundary	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1 Patterns, relations and functions

	create new functions in mathematical and real world situations.			polynomial equation to each representation.	Glencoe Algebra 2 (2010) Section 2-8 (pgs.117-121) Pearson Algebra 2 (2012) Section 2-8 (Pg. 114-120)		A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.1-Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and /or graphically.
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed, combined, and composed to create new functions in mathematical and real world situations.	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated polynomial equation to each representation.	Special Functions Objectives: SWBA to write and graph piecewise defined functions. SWBA to write and graph step functions. SWBA to graph and analyze Greatest Integer Functions. Suggested Text Glencoe Algebra 2 (2010) Section 2-6 (pgs.101-106) Section 2-8 (pgs.117-121) Pearson Algebra 2 (2012) Page 90	Piece-wise defined function Piece-wise linear function Step function Greatest integer function	2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic). A2.2.1 Patterns, relations and functions A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.1-Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and /or graphically.
	Families of functions exhibit properties and behaviors that can be recognized across representations. Functions can be transformed,	How do you explain the benefits of multiple methods of representing polynomial functions (tables, graphs, equations, and contextual situations)?	Polynomial functions and equations	Represent a polynomial function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations;	Special Functions Objectives: SWBA to graph and analyze Absolute Value Functions Suggested Text		2.8.A2.D-Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential, logarithmic).

	combined, and composed to create new functions in mathematical and real world situations.			relate the solution of the associated polynomial equation to each representation.	Glencoe Algebra 2 (2010) Section 2-6 (pgs.101-106) Pearson Algebra 2 (2012) Section 2-7 (Pg. 107-113) .		A2.2.1 Patterns, relations and functions A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.1-Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and /or graphically.
	Mathematical functions are relationships that assign each member of one set (domain) to a unique member of another set (range), and the relationship is recognizable across representations.	How do quadratic equations and their graphs and/or tables help us interpret events that occur in the world around us?	Quadratic functions and equations.	Represent a quadratic function in multiple ways, including tables, graphs, equations, and contextual situations, and make connections among representations; relate the solution of the associated quadratic equation to each representation.	Quadratic Functions and Relations/ Graphing Quadratic Functions Objectives: SWBA to graph quadratic functions. SWBA to find and interpret the maximum and minimum value of a quadratic function SWBA to write a quadratic function in vertex form . SWBA to transform graphs of quadratic functions in vertex form Suggested Text Glencoe Algebra 2 (2010) Chapter 5 -Section 5-1 (pgs 249-257) Section 5-7 (pgs 305-310) Pearson Algebra 2 (2012) Section 4-1 (Pg. 194-201)	Quadratic function Quadratic term Linear term Constant term Parabola Axis of symmetry Vertex Maximum value Minimum value	2.8.A2.B Evaluate and simplify algebraic expressions, for example: products/quotients of polynomials, logarithmic expressions and complex fractions; and solve and graph linear, quadratic, exponential, and logarithmic equations and inequalities, and solve and graph systems of equations and inequalities. 2.8.A2.D Demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, polynomial, rational, exponential and logarithmic) 2.8.A2.E Use combinations of symbols and numbers to create expressions, equations, and inequalities in two or

							more variables, systems of equations and inequalities, and functional relationships that model problem situation. 2.11.A2.A Determine the maximum and minimum values of a function over a specific interval. A2.2.1 Patterns, Relations and Functions A2.2.2 Applications of Functions A2.2.1.1 Analyze and/or use patterns or relations. A2.2.2.1 Create, interpret, and/or use polynomial exponential and/or logarithmic functions and their equations, graphs or tables. A2.2.1.1.4 Identify the characteristics of an exponential, quadratic, or polynomial function. A2.2.2.1.3 Determine, use and/or interpret maximum and minimum values over specified interval of a graph of a polynomial, exponential, logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one

							representation to another (graph table and equation).
	Review Unit 7 Common Assessment Families of Functions Duration: 1 Day						
	Test Unit 7 Common Assessment Families of Functions Duration: 1 Day						
Unit 8 Data Analysis and Probability							
Estimated Unit Time Frames	**Big Ideas**	**Essential Questions**	**Concepts (Know)**	**Competencies (Do)**	**Lessons/ Suggested Resources**	**Vocabulary**	**Standards/ Eligible Content**
18 Days	Bivariate data can be modeled with mathematical functions that approximate the data well and help us make predictions based on the data.	How can we use univariate and bivariate data to analyze relationships and make predictions?	Analysis of one and two variable (univariate and bivariate) data	Display, analyze, and make predictions using univariate and bivariate data.	The Counting Principle Objectives: SWBA to use the Fundamental Counting Principle to find outcomes involving independent and dependent events. SWBA to count permutations. SWBA to count combinations. Suggested Text- Glencoe Algebra 2 (2010) Section 0-4 (pgs P9-P11) Pearson Algebra 2 Section 11-1 (Pg. 674-680)	Outcome Sample space Event Fundamental Counting Principle Factoral	2.7.A2.A Use probability to predict the likelihood of an outcome in an experiment. A2.2.3 Data Analysis A2.2.3.2 Apply probability to practical situations. A.2.2.3.2.1 Use combinations and permutations, and the Fundamental Counting Principle to solve problems

	Bivariate data can be modeled with mathematical functions that approximate the data well and help us make predictions based on the data.	How can we use univariate and bivariate data to analyze relationships and make predictions?	Analysis of one and two variable (univariate and bivariate) data	Display, analyze, and make predictions using univariate and bivariate data.	Permutations and Combinations Objectives: SWBA to solve problems involving permutations and combinations. SWBA to count permutations. SWBA to count combinations Suggested Text- Glencoe Algebra 2 (2010) Section 0-5 (pgs P12-P14) Pearson Algebra 2 Section 11-1 (Pg. 674-680)	Permutation Linear Permutation Combination	2.7.A2.A Use probability to predict the likelihood of an outcome in an experiment. A2.2.3 Data Analysis A2.2.3.2 Apply probability to practical situations. A.2.2.3.2.1 Use combinations and permutations, and the Fundamental Counting Principle to solve problems.
	Bivariate data can be modeled with mathematical functions that approximate the data well and help us make predictions based on the data.	How can we use univariate and bivariate data to analyze relationships and make predictions?	Analysis of one and two variable (univariate and bivariate) data	Display, analyze, and make predictions using univariate and bivariate data.	Probability of Compound (Multiple) Events SWBA to find the probability of the event A and B. SWBA to find the probability of the event A or B. Pearson Algebra 2 Section 11-3 (Pg. 688-693)	Dependent events Independent events Mutually exclusive	2.7.A2.A Use probability to predict the likelihood of an outcome in an experiment. A2.2.3 Data Analysis A2.2.3.2 Apply probability to practical situations. A.2.2.3.2.1 Use combinations and permutations, and the Fundamental Counting Principle to solve problems
	Degree and direction of linear association between two	How do you differentiate between two independent events and two dependent events and how do you	Compound probabilities: addition and multiplication rules	Distinguish between independent and dependent events in order to calculate	Conditional Probability Objectives :	Conditional probability	2.7.A2.A Use probability to predict the likelihood of an outcome in an experiment.

	variables is measurable	calculate the probabilities for each situation?		compound probabilities within real world situations.	SWBA to find probabilities of events given the occurrence of other events. SWBA to use contingency tables to find conditional probabilities Suggested Text- Glencoe Algebra 2 (2010) Section 12 -3 (pgs 759-763) Pearson Algebra 2 Section 11-4 (Pg. 696-702)	Contingency table Relative frequency	2.7.A2.E Use probability to make judgments about the likelihood of various outcomes. A2.2.3 Data Analysis A2.2.3.2 Apply probability to practical situation A.2.2.3.2.3 Use probabilities for independent and dependent events or compound events to predict outcomes
	Degree and direction of linear association between two variables is measurable	How do you differentiate between two independent events and two dependent events and how do you calculate the probabilities for each situation?	Compound probabilities: addition and multiplication rules	Distinguish between independent and dependent events in order to calculate compound probabilities within real world situations.	Probability and Probability Distributions Suggested Text-Glencoe Algebra 2 (2010) Section 12-4 (pgs 764-771) Pearson Algebra 2 Section 11-2 (Pg. 681-687) Concept Byte 11-3 (Pgs. 694-695) Objectives: SWBA to find probabilities by using combinations and permutations.	Probability Success Failure Sample space Random variable Probability distribution Uniform distribution Relative – frequency graph	2.7.A2.A Use probability to predict the likelihood of an outcome in an experiment. 2.7.A2.E Use probability to make judgments about the likelihood of various outcomes. A2.2.3 Data Analysis A2.2.3.2 Apply probability to practical situation . A.2.2.3.2.3 Use probabilities for independent and dependent events or compound events to predict outcomes

					SWBA to create and use graphs to probability distributions	Discrete probability distribution Theoretical probability Expected value	
	Degree and direction of linear association between two variables is measurable	How do you differentiate between two independent events and two dependent events and how do you calculate the probabilities for each situation?	Probability and Odds	Determine odds as probability and probability as odds.	Probability and Odds SWBA to convert a probability to odds. SWBA to convert odd to probability. SWBA to use odds to determine the probability of an event SWBA to use probability to determine the odds for an event. **Glencoe "Advanced Mathematical Concepts (2004)** **Section 13-3** **(Pgs. 852-858)** http://www.pdesas.org/ContentWeb/Content/Content/6188/LessonPlan	Probabiltiy Odds	2.7.A2.A Use probability to predict the likelihood of an outcome in an experiment. 2.7.A2.E Use probability to make judgments about the likelihood of various outcomes. A2.2.3 Data Analysis A2.2.3.2 Apply probability to practical situation A2.2.3.2.2 Use odds to find probability and/or probability to find odds A.2.2.3.2.3 Use probabilities for independent and dependent events or compound events to predict outcomes
	Review Unit 8 Common Assessment Data Analysis and Probability Duration: 1 day						
	Test Unit 8 Common Assessment Data Analysis and Probability Duration: 1 day						

Unit 9 Sequence and Series

Estimated Unit Time Frames	Big Ideas	Essential Questions	Concepts (Know)	Competencies (Do)	Lessons/ Suggested Resources	Vocabulary	Standards/ Eligible Content
11 Days	Patterns exhibit relationships that can be extended, described, and generalized.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Sequences and Series/ Sequences as Functions Suggested Text- Objectives : SWBA to relate arithmetic sequences to linear functions. SWBA to relate geometric sequences to exponential functions. Glencoe Algebra 2 (2010) Section 11-1 (pgs 681-687) Pearson Algebra 2 Section 9-1 (Pg. 564-571)	Sequence Term Finite sequence Infinite sequence Arithmetic sequence Common difference Geometric sequence Common ratio	2.8.A2.C-Recognize, describe and generalize patterns using sequences and series to predict long-term outcomes A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.2-Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term).
	Patterns exhibit relationships that can be extended, described, and generalized.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Arithmetic Sequences and Series Objectives: SWBA to use arithmetic sequences . SWBA to find the sum of arithmetic series Suggested Text- Glencoe Algebra 2 (2010) Section 11-2 (pgs 688-695)	Arithmetic means Series Arithmetic series Partial sum Sigma notation	2.8.A2.C-Recognize, describe and generalize patterns using sequences and series to predict long-term outcomes A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.2-Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term).

					Pearson Algebra 2 Section 9-2 (Pg. 572-577) Section 9-4 (Pg. 587-593)		2.8.A2.B-Evaluate and simplify algebraic expressions; solve and graph, quadratic, exponential, and logarithmic equations; and, solve and graph systems of equations and inequalities.
	Patterns exhibit relationships that can be extended, described, and generalized.	How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?	Polynomial functions and equations	Extend algebraic properties and processes to quadratic exponential and polynomial expressions and equations and to matrices, and apply them to solve real world problems.	Geometric Sequences and Series Objectives: SWBA to use geometric sequences. SWBA to find sums of geometric series Suggested Text- Glencoe Algebra 2 (2010) Section 11-3 (pgs 696-702) Pearson Algebra 2 Section 9-3 (Pg. 580-686) Section 9-5 (Pgs. 595-601)	Geometric means Geometric series	2.8.A2.C-Recognize, describe and generalize patterns using sequences and series to predict long-term outcomes A2.2.1.1-Analyze and/or use patterns or relations. A2.2.1.1.2-Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term).
	Review Unit 9 Common Assessment Sequence and Series Duration: 1 day						
	Test Unit 9 Common Assessment Sequence and Series Duration: 1 day						
During the course of the year, we will have at least 6 days scheduled for the use of the Classroom Diagnostic Tool for this course. Since these dates have not been scheduled, there may need to be adjustments to the day to day schedule when these testing dates are schedules in. Also, there may need to be 3 days build in for the PSSA or Keystone Exams.							
							August 2020-2021