

GADSDEN CITY CURRICULUM GUIDE ESSENTIAL CONTENT AND SKILLS ALGEBRA II WITH TRIGONOMETRY Block

TEXT: GLENCOE ALGEBRA 2

Date Taught	Objective	Standard	Text Section	Section Name	Additional Resources	Suggested Time Frame (Block)	Ch. Time Frame
	Interpret parts of an expression, such as terms, factors, and coefficients. [A.SSE.1a] Interpret complicated expressions by viewing one or more of their parts as a single entity.[A.SSE.1b]Use the structure of an expression to identify ways to rewrite it [A.SSE.2]Create equations and inequalities in one variable and use them to solve problems. [A.CED.1] Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [A.CED.3]	A.SSE.1.a, A.SSE.1.b	1.1	Expressions and Formulas		1/2	5 Days
		A.SSE.2	1.2	Properties of Real Numbers		1/2	
		A.CED.1	1.3	Solving Equations		1/2	
		A.SSE.1.b, A.CED.1	1.4	Solving Absolute Value Equations		1/2	
		A.CED.1, A.CED.3	1.5	Solving Inequalities		1/2	
		A.CED.1, A.CED.3	1.6	Solving Compound and Absolute Value Inequalities		1/2	
	Review Ch. 1					1	
	Test Ch. 1					1	
	Interpret complicated expressions by viewing one or more of their parts as a single entity.[A.SSE.1b] Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [A.CED.2] For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. [F.IF.4] Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.* [F.IF.5] Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. * [F.IF.6] Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [F.IF.9]	F.IF.4, F.IF.5	2.1	Relations and Functions		1/2	5 Days
		F.IF.4, F.IF.9	2.2	Linear Relations and Functions		1/2	
		F.IF.4, F.IF.6	2.3	Rate of Change and Slope		1/2	
		A.SSE.1b, A.CED.2, F.IF.4	2.4	Writing Linear Equations		1	
	Review 2.1-2.4					1	
	Test 2.1-2.4					1	

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	<p>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. [F.IF.4] Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. * [F.IF.7] Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. [F.IF.7b] Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. [F.BF.3] Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [A.CED.3] Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. * [F.IF.6] Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. [F.IF.8] Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [A.CED.2]</p>	F.IF.4, F.IF.7.b, F.BF.3	2.6	Special Functions		1/2	5 Days	
		F.IF.4, F.BF.3	2.7	Parent Functions and Transformations	LTF Parent Functions	1/2		
		A.CED.3	2.8	Graphing Linear and Absolute Value Inequalities		1/2		
		F.IF.4, F.IF.6, F.IF.8.a, F.BF.3	4.7	Transformations of Quadratic Graphs		1/2		
		F.IF.7.b, F.BF.3	6.3	Square Root Functions and Inequalities		1/2		
		A.CED.2, F.BF.3	8.3	Graphing Reciprocal Functions		1/2		
		Review Parent and Translation Graphs						1
		Test Parent and Translation Graphs						1

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	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [A.CED.3] Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A.REI.11]	A.CED.3, A.REI.11	3.1	Solving Systems of Equations		1	7 Days	
		A.CED.3	3.2	Solving Systems of Inequalities by Graphing		1/2		
		A.CED.3	3.3	Optimization with Linear Programming		1/2		
		A.CED.3	3.4	Systems of Equations in Three Variables		1		
	Use matrices to represent and manipulate data [N.VM6] Multiply matrices by scalars to produce new matrices [N.VM7]. Add, Subtract, and multiply matrices of appropriate dimensions [N.VM8]. Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties. [N.VM9]. Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse. [N.VM10] Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology) [A.REI9].	N.VM.6,7,8	3.5	Operations with matrices		1/2 day		
		N.VM.9	3.6	Multiplying matrices		1/2 day		
		N.VM.10 (determinant only)	3.7	Solving systems of equations using Kramer's rule		1/2 day		
		N.VM.10 (inverses), A.RE.9	3.8	Solving systems of equations using inverse matrices		1/2 day		
	Review 3.1-3.4							1
	Test 3.2-3.4							1

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	<p>Interpret parts of an expression, such as terms, factors, and coefficients. [A.SSE.1a] For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. [F.IF.4] Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [F.IF.9] Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [A.CED.2] Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A.REI.11] Use the structure of an expression to identify ways to rewrite it. [A.SSE.2] Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. [F.IF.8] Know there is a complex number i such that $i^2=-1$, and every complex number has the form $a+bi$ with a and b real. [N.CN.1] Use the relation $i^2=-1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. [N.CN.2] Solve quadratic equations with real coefficients that have complex solutions. [N.CN.3] Find the moduli and quotient of complex numbers] [N.CN.7] Interpret complicated expressions by viewing one or more of their parts as a single entity.[A.SSE.1b] Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. [F.BF.3] Create equations and inequalities in one variable and use them to solve problems. [A.CED.1] Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [A.CED.3]</p>	A.SSE.1.a, F.IF.9	4.1	Graphing Quadratic Functions		1/2	7 Days
		A.CED.2, A.REI.11	4.2	Solving Quadratic Equations by Graphing		1/2	
		Review	0.3	Factoring Polynomials		1/2	
		A.SSE.2, F.IF.8.a	4.3	Solving Quadratic Equations by Factoring		1/2	
		Review		Simplifying Square Roots		1/2	
		N.CN.1, N.CN.2, N.CN.3	4.4	Complex Numbers		1/2	
		N.CN.7, F.IF.8.a	4.5	Completing the Square		1/2	
		N.CN.7, A.SSE.1.b, F.BF.3	4.6	The Quadratic Formula and the Discriminant		1/2	
		A.CED.1, A.CED.3	4.8	Quadratic Inequalities		1/2	
		Review Ch. 4				1	
	Test Ch. 4				1		

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Date Taught	Objective	Standard	Text Section	Section Name	Additional Resources	Suggested Time Frame (Block)	Ch. Time Frame
	Understand that polynomials form a system analogous to the intergers; namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. [A.APR.1] For a function that models a relationship between two quantities,	A.APR.1	5.1	Operations with Polynomials		1/2	6 Days
	interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. [F.IF.4] Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. [F.IF.7c] Create equations and inequalities in one variable and use them to solve problems. [A.CED.1] Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A.REI.11]	F.IF.4, F.IF.7.c	5.3	Polynomial Functions		1	
	Rewrite simple rational expressions in different forms; write polynomials in the form $q(x)+r(x)/b(x)$, using inspection, long division, or for the more complicated examples, a computer algebra system. [A.APR.6] Know and apply the Remainder Theorem. [A.APR.2] Know the Fundamental Theorem of Algebra [N.CN.9] Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. [A.APR.3] Prove polynomial identities and use them to describe numerical relationships. [A.APR.4] Know and apply the Binomial Theorem for the expressions with n power using Pascal's Triangle. [A.APR.5]	F.IF.4, F.IF.7.c	5.4	Analyzing Graphs of Polynomial Functions			
		A.CED.1, A.REI.11	5.5	Solving Polynomial Equations		1/2	
		A.APR.6, F.IF.4	5.2	Dividing Polynomials		1/2	
		A.APR.2, F.IF.7.c	5.6	The Remainder and Factor Theorem		1/2	
		N.CN.9, A.APR.3, A.APR.4	5.7	Roots and Zeros		1	
		Review Ch. 5 & 10.6				1	
		Test Ch. 5 & 10.6				1	

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	<p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [F.IF.9] Combine standard function types using arithmetic operations. [F.BF.1b] For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. [F.IF.4] Solve an equation of the form $f(x)=c$ for a simple function f that has an inverse, and write an expression for the inverse. [F.BF.4a] Use the structure of an expression to identify ways to rewrite it [A.SSE.2] Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. [A.REI.2] Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A.REI.11]</p>	F.IF.9, F.BF.1.b	6.1	Operations on Functions		1/2	6 Days
		A.SSE.2, F.IF.7.b, F.BF.3	6.4	n th Roots		1/2	
		A.SSE.2	6.5	Operations with Radical Expressions		1/2	
		Review	6.6	Rational Exponents		1/2	
		A.REI.2, A.REI.11	6.7	Solving Radical Equations and Inequalities		1/2	
		Review Ch. 6				2	
		Test Ch. 6				1	

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Date Taught	Objective	Standard	Text Section	Section Name	Additional Resources	Suggested Time Frame (Block)	Ch. Time Frame	
		F.BF.4.a	6.2	Inverse Function and Relations		1/2		
	Graph exponential and log functions showing intercepts and end behavior [F.IF.7e] Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. [F.IF.8] Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A.REI.11] Create equations and inequalities in one variable and use them to solve problems. [A.CED.1] For exponential models, express as a log the solution to $ab^c=d$ where a, c, and d are numbers, and the base is 2, 10, or e evaluate the log using technology. [F.LE.4] Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. [F.BF.3] Use the structure of an expression to identify ways to rewrite it [A.SSE.2] Build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate the functions to the model. [F.BF.1b]	F.IF.7.e, F.IF.8.b, A.REI.11	7.1	Graphing Exponential Functions		1/2	8 Days	
		A.CED.1, F.LE.4	7.2	Solving Exponential Equations and Inequalities		1/2		
		F.IF.7.e, F.BF.3	7.3	Logarithms and Logarithmic Functions		1/2		
		A.SSE.2, A.CED.1	7.4	Solving Logarithmic Equations and Inequalities		1		
		A.CED.1	7.5	Properties of Logarithms		1		
		A.CED.1, A.REI.11	7.6	Common Logarithms		1		
		A.SSE.2	7.7	Base e and Natural Logarithms		1/2		
		F.IF.8.b, F.LE.4, F.BF.1.b	7.8	Using Exponential and Logarithmic Functions		1		
			Review Ch. 7					1
			Test Ch. 7					1

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	<p>Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions. [A.APR.7] Create equations in two or more variable to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [A.CED.2] Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [A.CED.3] Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal description. [F.IF.9] Create equations and inequalities in one variable and use them to solve problems. [A.CED.1] Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. [A.REI.2] Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$; find the solutions approximately, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A.REI.11]</p>	Review	8.1	Multiplying and Dividing Rational Expressions		1/2	5 Days
		Review	8.2	Adding and Subtracting Rational Expressions		1/2	
		A.CED.2, F.IF.9	8.4	Graphing Rational Functions		1	
		A.CED.2	8.5	Variation Functions		1/2	
		A.CED.1, A.REI.2, A.REI.11	8.6	Solving Rational Equations and Inequalities		1	
	Review Ch. 8					1	
	Test Ch. 8					1	

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Date Taught	Objective	Standard	Text Section	Section Name	Additional Resources	Suggested Time Frame (Block)	Ch. Time Frame
	Understand the graphs and equations of conic sections. (Emphasize understanding graphs and equations of circles and parabolas). Create graphs of conic sections, including parabolas, hyperbolas, ellipses, circles, and degenerate conics, from second degree equations.	AL Standard 28	9.3	Circles		1/2	5 Days
			9.4	Ellipses		1/2	
			9.5	Hyperbolas		1/2	
			9.6	Identifying Conic Sections		1/2	
			9.7	Solving systems nonlinear		1	
Review Ch. 9							
Test Ch. 9							
Date Taught	Objective	Standard	Text Section	Section Name	Additional Resources	Suggested Time Frame (Block)	Ch. Time Frame
	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. [F.TF.1] Explain how the unit circle in the coordinate plane enables the extension of trig functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. [F.TF.2] Define six trig functions using ratios of the sides of a right triangle, coordinates on the unit circle, and the reciprocal of other functions. [AL Standard]	AL Standard	12.1	Trig Functions in Right Triangles		1	7 Days
		F.TF.1	12.2	Angles and Angle Measure		1	
		AL Standard	12.3	Trig Functions of General Angles		2	
		F.TF.1, F.TF.2	12.6	Circular and Periodic Functions		1	
Review 12.1-12.6						1	
Test 12.1-12.6						1	

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	Graph trig functions, showing period, midline, and amp. [F.IF.7e] Choose trig functions to model periodic phenomena with specified amp, frequency, and midline. [F.TF.5] Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k ; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. [F.BF.3] Create equations in two or more variable to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [A.CED.2]	F.IF.7.e, F.TF.5, F.BF.3	12.7	Graphing Trig Functions		2	4 Days	
	Review 12.7-12.9						1	
	Test 12.7-12.9						1	
Date Taught	Objective	Standard	Text Section	Section Name	Additional Resources	Suggested Time Frame (Block)	Ch. Time Frame	
	Describe events as subsets of a sample space, using outcomes, unions and intersections and complements [S.CP.1] Understand the conditional probability of A given B as P, and interpret independence of A and B [S.CP.3] Construct and interpret two-way frequency tables of data [S.CP.4] Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations [S.CP.5] Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model [S.CP.6] Apply the Addition Rule [S.CP.7] Apply the general Multiplication Rule [S.CP.8] Use permutations and combinations to compute probabilities of compound events and solve problems. [S.CP.9] Use probabilities to make fair decisions. [S.MD.6] Analyze decisions and strategies using probability concepts. [S.MD.7]	S.CP.9	11.1	Permutations and Combinations	Pearson Alg 2 book	1/2	5 Days	
		S.CP.1-8	11.2	Probability	Pearson Alg 2 book	1/2		
		S.CP.1-8	11.3	Probability of Multiple events	Pearson Alg 2 book	1/2		
		S.CP.1-8	11.4	Conditional Probability	Pearson Alg 2 book	1/2		
		S.CP.1-8	11.5	Probability Models	Pearson Alg 2 book	1/2		
		S.CP.1-8, S.MD.6, S.MD.7	11.6	Analyzing Data	Pearson Alg 2 book	1/2		
	Review Ch. 11						1	
	Test Ch. 11						1	
	Review for Semester Exam						3	4 Days
	Semester Exam						1	

