

Algebra II with Trigonometry Curriculum 2013-14

Month	Unit Name	Content	Skills	Standards: Performance Indicators	
September	Functions	Fractions	Perform arithmetic operations with polynomial expressions containing rational coefficients	A2.N.3	
		Introduction to Functions	Define a relation and a function	A2.A.37	
			Determine when a relation is a function	A2.A.38	
			Determine if a function is one-to-one, onto, or both	A2.A.43	
			Write functions in functional notation	A2.A.40	
		Function Notation	Use functional notation to evaluate functions for given values in the domain	A2.A.41	
			Approximate the solution to polynomial equations of a higher degree by inspecting the graph	A2.A.50	
			Compositions	Find the composition of functions	A2.A.42
		Domain and Range	Determine the domain and range of a function from its equation	A2.A.39	
			Determine the domain and range of a function from its graph	A2.A.51	
		Inverses	Define the inverse of a function	A2.A.44	
			Determine the inverse of a function and use composition to justify the result	A2.A.45	
		Linear Relationships	Variation	Use direct and inverse variation to solve for unknown values	A2.A.5
			Linear Regression	Determine the function for the regression model, using appropriate technology, and use the regression function to interpolate and extrapolate from the data	A2.S.7
Interpret within the linear regression model the value of the correlation coefficient as a measure of the strength of the relationship	A2.S.8				
October	Quadratics	Factoring	Factor polynomial expressions completely, using any combination of the following techniques: common factor extraction, difference of two perfect squares, quadratic trinomials	A2.A.7	
		Zero-Product Law	Find the solution to polynomial equations of higher degree that can be solved using factoring and/or the quadratic formula	A2.A.26	
		Quadratic Inequalities	Solve quadratic inequalities in one and two variables, algebraically and graphically	A2.A.4	
		Completing the Square	Know and apply the technique of completing the square	A2.A.24	

		Circles	Determine the center-radius form for the equation of a circle in standard form	A2.A.47	
			Write the equation of a circle, given its center and a point on the circle	A2.A.48	
			Write the equation of a circle from its graph	A2.A.49	
		Systems of Equations	Solve systems of equations involving one linear equation and one quadratic equation algebraically	A2.A.3	
		Transformations	Perform transformations with functions and relations: $f(x + a)$, $f(x) + a$, $f(-x)$, $-f(x)$, $af(x)$	A2.A.46	
		Absolute Value	Solve absolute value equations and inequalities involving linear expressions in one variable	A2.A.1	
November	Exponents	Simplifying Radicals	Perform arithmetic operations (addition, subtraction, multiplication, division) with expressions containing irrational numbers in radical form	A2.N.2	
			Perform arithmetic operations on irrational expressions	A2.N.4	
			Simplify radical expressions	A2.A.13	
			Perform addition, subtraction, multiplication, and division of radical expressions	A2.A.14	
			Perform arithmetic operations with rational expressions and rename to lowest terms	A2.A.16	
		Radical Equations	Solve radical equations	A2.A.22	
		Rationalizing Denominators	Rationalize a denominator containing a radical expression	A2.N.5	
			Rationalize denominators involving algebraic radical expressions	A2.A.15	
		Quadratic Formula	Solve quadratic equations, using the quadratic formula	A2.A.25	
		Negative and Fractional Exponents	Apply the rules of exponents to simplify expressions involving negative and/or fractional exponents	A2.A.8	
			Rewrite algebraic expressions that contain negative exponents using only positive exponents	A2.A.9	
			Rewrite algebraic expressions with fractional exponents as radical expressions	A2.A.10	
			Rewrite algebraic expressions in radical form as expressions with fractional exponents	A2.A.11	
		Sum and Product of Roots	Determine the sum and product of the roots of a quadratic equation by examining its coefficients	A2.A.20	
			Determine the quadratic equation, given the sum and product of its roots	A2.A.21	
		Complex Numbers	Imaginary Numbers	Write square roots of negative numbers in terms of i	A2.N.6
				Simplify powers of i	A2.N.7

		Complex Numbers	Determine the conjugate of a complex number	A2.N.8
			Perform arithmetic operations on complex numbers and write the answer in the form $a + bi$. <i>Note: This includes simplifying expressions with complex denominators.</i>	A2.N.9
		Discriminant	Use the discriminant to determine the nature of the roots of a quadratic equation	A2.A.2
December	Polynomials and Rationals	Polynomial Equations	Find the solution to polynomial equations of higher degree that can be solved using factoring and/or the quadratic formula	A2.A.26
		Rationals	Perform arithmetic operations with rational expressions and rename to lowest terms	A2.A.16
			Solve rational equations and inequalities	A2.A.23
		Complex Fractions	Simplify complex fractional expressions	A2.A.17
January	Introduction to Trigonometry	Trigonometric Ratios	Express and apply the six trigonometric functions as ratios of the sides of a right triangle	A2.A.55
			Find the value of trigonometric functions, if given a point on the terminal side of angle θ	A2.A.62
			Use inverse functions to find the measure of an angle, given its sine, cosine, or tangent	A2.A.64
			Determine the trigonometric functions of any angle, using technology	A2.A.66
		Angles	Sketch and use the reference angle for angles in standard position	A2.A.57
		Radians	Determine the length of an arc of a circle, given its radius and the measure of its central angle	A2.A.61
			Define radian measure	A2.M.1
			Convert between radian and degree measures	A2.M.2
		Exact Values	Know the exact values and approximate values of the sine, cosine, tangents, of 0, 30, 45, 60, 90, 180, and 270 degree angles	A2.A.56
			Know and apply the co-function and reciprocal relationships between trigonometric ratios	A2.A.58
			Use the reciprocal and co-function relationships to find the value of the secant, cosecant, and cotangent of 0, 30, 45, 60, 90, 180, and 270 degree angles	A2.A.59
		The Unit Circle	Sketch the unit circle and represent angles in standard position	A2.A.60
		Trigonometric Graphs	Determine the amplitude, period, frequency, and phase shift, given the graph or equation of a periodic function	A2.A.69
			Sketch and recognize one cycle of a function of the form $y = A \sin Bx$ or $y = A \cos Bx$	A2.A.70
			Sketch and recognize the graphs of the functions $y = \sec(x)$,	A2.A.71

			$y = \csc(x)$, $y = \tan(x)$, and $y = \cot(x)$	
			Write the trigonometric function that is represented by a given periodic graph	A2.A.72
		Inverse Trigonometric Functions	Restrict the domain of the sine, cosine, and tangent functions to ensure the existence of an inverse function	A2.A.63
			Sketch the graph of the inverses of the sine, cosine, and tangent functions	A2.A.65
February	Trigonometric Equations	Trigonometric Equations	Solve trigonometric equations for all values of the variable from 0 to 360 degrees	A2.A.68
		Trigonometric Identities	Justify the Pythagorean identities	A2.A.67
			Apply the sum and difference formulas for trigonometric functions	A2.A.76
			Apply the double-angle and half-angle formulas for trigonometric functions	A2.A.77
	Applications of Trigonometry	Area of a Triangle	Determine the area of a triangle or parallelogram, given the measure of two sides and the included angle	A2.A.74
		Laws of Sines and Cosines	Solve for an unknown side or angle, using the Law of Sines or the Law of Cosines	A2.A.73
The Ambiguous Case		Determine the solution(s) from the SSA situation (ambiguous case)	A2.A.75	
March	Exponentials	Exponential Equations	Solve exponential equations with and without common bases	A2.A.27
			Solve an application which results in an exponential function	A2.A.6
			Graph exponential functions of the form $y = b^x$ for positive values of b , including $b = e$	A2.A.53
			Evaluate exponential expressions, including those with base e	A2.A.12
		Logarithms	Evaluate logarithmic expressions in any base	A2.A.18
			Apply the properties of logarithms to rewrite logarithmic expressions in equivalent forms	A2.A.19
			Solve a logarithmic equation by writing as an exponential equation	A2.A.28
			Graph logarithmic functions, using the inverse of the related exponential function	A2.A.54
	Regression	Determine from a scatter plot whether a linear, logarithmic, exponential, or power regression model is most appropriate	A2.S.6	
	Probability	The Fundamental Principle of Counting	Use permutations, combinations, and the Fundamental Principle of Counting to determine the number of elements in a sample space and a specific subset (event)	A2.S.12
Differentiate between situations requiring permutations and those requiring combinations			A2.S.9	

			Calculate the number of possible permutations (${}_nP_r$) of n items taken r at a time	A2.S.10
			Calculate the number of possible combinations (${}_nC_r$) of n items taken r at a time	A2.S.11
		Theoretical and Empirical Probability	Calculate theoretical probabilities, including geometric applications	A2.S.13
			Calculate empirical probabilities	A2.S.14
			Know and apply the binomial probability formula to events involving the terms <i>exactly</i> , <i>at least</i> , and <i>at most</i>	A2.S.15
		Binomial Theorem	Apply the binomial theorem to expand a binomial and determine a specific term of a binomial expansion	A2.A.36
April	Statistics	Studies	Understand the differences among various kinds of studies (e.g., survey, observation, controlled experiment)	A2.S.1
			Determine factors which may affect the outcome of a survey	A2.S.2
		Statistical Measures	Calculate measures of central tendency with group frequency distributions	A2.S.3
			Calculate measures of dispersion (range, quartiles, interquartile range, standard deviation, variance) for both samples and populations	A2.S.4
		The Normal Distribution	Know and apply the characteristics of the normal distribution	A2.S.5
			Use the normal distribution as an approximation for binomial probabilities	A2.S.16
	Sequences and Series	Sigma Notation	Know and apply sigma notation	A2.N.10
			Represent the sum of a series, using sigma notation	A2.A.34
		Sequences	Identify an arithmetic or geometric sequence and find the formula for its n th term	A2.A.29
			Determine a specified term on an arithmetic or geometric sequence	A2.A.32
			Determine the common difference in an arithmetic sequence	A2.A.30
			Determine the common ratio in a geometric sequence	A2.A.31
			Specify terms of a sequence, given its recursive definition	A2.A.33
	Series	Determine the sum of the first n terms of an arithmetic or geometric series	A2.A.35	
	May	Review	Review	
June	Review	Review		