

2003/2010 ACOS MATHEMATICS CONTENT CORRELATION ALGEBRA II WITH TRIGONOMETRY

2003 ACOS		2010 ACOS
CURRENT ALABAMA CONTENT PLACEMENT		2010 ALGEBRA II W/ TRIGONOMETRY CONTENT
AIIT.1	Determine the relationships among the subsets of complex numbers.	AIIT.1. 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-CN1]
AIIT.2	Simplify expressions involving complex numbers, using order of operations and including conjugate and absolute value.	AIIT.2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. [N-CN2] AIIT.26. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. [F-IF8]
AIIT.3	Analyze families of functions, including shifts, reflections, and dilations of $y = \frac{k}{x}$ (inverse variation), $y = kx$ (direct variation/linear), $y = x^2$ (quadratic), $y = a^x$ (exponential), and $y = \log_a x$ (logarithmic).	AIIT.27. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [F-IF9] AIIT.29. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. [F-BF3]
AIIT.3.B.1	Identifying the domain and range of a relation given its graph, a table of values, or its equation, including those with restricted domains	AIIT.22. 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. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> * [F-IF4] AIIT.23. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.* [F-IF5]
AIIT.3.B.2	Identifying real-world situations corresponding to families of functions	AIIT.6. Interpret expressions that represent a quantity in terms of its context.* [A-SSE1] AIIT.24. 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-IF6]
AIIT.4	Determine approximate real zeros of functions graphically and numerically and exact real zeros of polynomial functions.	AIIT.11. 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-APR3] AIIT.25b. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.* [F-IF7c]
AIIT.4.B.1	Using the zero product property, completing the square, and the quadratic formula	AIIT.3. Solve quadratic equations with real coefficients that have complex solutions. [N-CN7] AIIT.4. (+) Extend polynomial identities to the complex numbers. [N-CN8] AIIT.11. 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-APR3]
AIIT.4.B.2	Deriving the quadratic formula	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY

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AIIT.5	Identify the characteristics of quadratic functions from their roots, graphs, or equations.	AIIT.5. Know the Fundamental Theorem of Algebra ; show that it is true for quadratic polynomials . [N-CN9] AIIT.22. 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. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> * [F-IF4] AIIT.25. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. * [F-IF7]
AIIT.5.B.1	Writing an equation when given its roots or graph	AIIT.22. 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. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> * [F-IF4]
AIIT.5.B.2	Graphing a function when given its equation	AIIT.22. 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. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> * [F-IF4] AIIT.25. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. * [F-IF7] AIIT.25a. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. * [F-IF7b] AIIT.25b. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. * [F-IF7c] AIIT.25c. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. * [F-IF7e]
AIIT.5.B.3	Determining the nature of the solutions of a quadratic equation	AIIT.22. 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. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> * [F-IF4]
AIIT.5.B.4	Determining the maximum or minimum values of quadratic functions both graphically and algebraically	AIIT.16. Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> * [A-CED1] AIIT.22. 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. <i>Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</i> * [F-IF4] AIIT.28. Write a function that describes a relationship between two quantities.*[F-BF1]
AIIT.6	Perform operations on functions, including addition, subtraction, multiplication, division, and composition.	AIIT.10. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$. [A-APR2]

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AIIT.6.B.1	Determining the inverse of a function or a relation	AIIT.30. 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-BF4a]
AIIT.6.B.2	Performing operations on polynomial and rational expressions containing variables	AIIT.7. Use the structure of an expression to identify ways to rewrite it. [A-SSE2] AIIT.14. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. [A-APR6] AIIT.15. (+) 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-APR7]
AIIT.6.B.3	Constructing graphs by analyzing their functions as sums or differences	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.7	Solve equations, inequalities, and applied problems involving absolute values, radicals, and quadratics over the complex numbers, as well as exponential and logarithmic functions.	AIIT.7. Use the structure of an expression to identify ways to rewrite it. [A-SSE2] AIIT.20. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. [A-REI2] AIIT.21. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.* [A-REI11]
AIIT.7.B.1	Solving equations using laws of exponents, including rational and irrational exponents	AIIT.7. Use the structure of an expression to identify ways to rewrite it. [A-SSE2]
AIIT.7.B.2	Expressing the solution of an equation, inequality, or applied problem as a graph on a number line or by using set or interval notation	AIIT.17. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.* [A-CED2] AIIT.28. Write a function that describes a relationship between two quantities.*[F-BF1] AIIT.28a. Combine standard function types using arithmetic operations. (<i>Include all types of functions studied</i>) [F-BF1b]
AIIT.8	Solve systems of linear equations or inequalities in two variables using algebraic techniques, including those involving matrices.	AIIT.17. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.* [A-CED2]
AIIT.8.B.1	Evaluating the determinant of a 2x2 or 3x3 matrix	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.8.B.2	Solving word problems involving real-life situations	AIIT.17. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.* [A-CED2] AIIT.18. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.* [A-CED3]
AIIT.9	Graph trigonometric functions of the form $y=a \sin(bx)$, $y=a \cos(bx)$, and $y=a \tan(bx)$.	AIIT.25c. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline , and amplitude.* [F-IF7e] AIIT.35. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.* [F-TF5]
AIIT.9.B.1	Determining period and amplitude of sine, cosine, and tangent functions from graphs or basic equations	AIIT.35. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.* [F-TF5]
AIIT.9.B.2	Determining specific unit circle coordinates associated with special angles	AIIT.32. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.[F-TF1] AIIT.33. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. [F-TF2]

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AIIT.10	Solve general triangles, mathematical problems, and real-world applications using the Law of Sines and the Law of Cosines.	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.10.B.1	Deriving formulas for Law of Sines and Law of Cosines	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.10.B.2	Determining area of oblique triangles	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.11	Define the six trigonometric functions using ratios of the sides of a right triangle, coordinates on the unit circle, and the reciprocal of other functions.	AIIT.33. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. [F-TF2] AIIT.34. Define the six trigonometric functions using ratios of the sides of a right triangle, coordinates on the unit circle, and the reciprocal of other functions. (AL)
AIIT.12	Verify simple trigonometric identities using Pythagorean and/or reciprocal identities.	AIIT.36. Prove the Pythagorean identity $(\sin A)^2 + (\cos A)^2 = 1$ and use it to find $\sin(\Theta)$, $\cos(\Theta)$, or $\tan(\Theta)$ given $\sin(\Theta)$, $\cos(\Theta)$ or $\tan(\Theta)$ and the quadrant of the angle. [F-TF8]
AIIT.13	Use different forms of representation to compare characteristics of data gathered from two populations.	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.13.B.1	Evaluating the appropriateness of the design of an experimental study	AIIT.37. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.*[S-ID4] AIIT.39. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.* [S-IC2] AIIT.40. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.* [S-IC3] AIIT.45. Analyze decisions and strategies using probability concepts (e.g. product testing, medical testing, pulling a hockey goalie at the end of the game). [S-MD7]
AIIT.13.B.2	Describing how sample statistics reflect values of population parameters	AIIT.38. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.*[S-IC1] AIIT.42. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.* [S-IC5]
AIIT.14	Determine an equation of linear regression from a set of data.	AIIT.43. Evaluate reports based on data.* [S-IC6]
AIIT.14.B.1	Examining data to determine if a linear or quadratic relationship exists and to predict outcomes	AIIT.43. Evaluate reports based on data.* [S-IC6] AIIT.41. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.* [S-IC4]
AIIT.15	Calculate probabilities of events using the laws of probability.	AIIT.44. Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).* [S-MD6]
AIIT.15.B.1	Using permutations and combinations to calculate probabilities	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.15.B.2	Calculating conditional probability	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
AIIT.15.B.3	Calculating probabilities of mutually exclusive events, independent events, and dependent events	CONTENT NOT ADDRESSED IN ALGEBRA II WITH TRIGONOMETRY
CONTENT MOVED TO ALGEBRA II WITH TRIGONOMETRY IN 2010 ACOS		
	FOUNDATIONAL KNOWLEDGE	AIIT.6a. Interpret parts of an expression, such as terms, factors, and coefficients. [A-SSE1a]
AI.5	Perform operations of addition, subtraction, and multiplication on polynomial expressions.	AIIT.9. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.[A-APR1]
AI.7	Solve multistep equations and inequalities including linear, radical, absolute value, and literal equations.	AIIT.19. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.* [A-CED4]

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A3S.7	Expand powers of binomials using the Binomial Theorem.	A1T.13. Know and apply that the Binomial Theorem gives the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.) [A-APR5]
A3S.7.B.1	Using Pascal's triangle	
PC.6	Apply the laws of logarithms to simplify expressions and to solve equations using common logarithms, natural logarithms, and logarithms with other bases.	A1T.31. For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.* [F-LE4a]
PC.9.1	Determining characteristics of arithmetic and geometric sequences and series, including those defined with recurrence relations, first terms, common differences or ratios, n^{th} terms, limits, or statements of convergence or divergence	A1T.8. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. [A-SSE4]
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		A1T.6b. Interpret complicated expressions by viewing one or more of their parts as a single entity. [A-SSE1b]
		A1T.12. Prove polynomial identities and use them to describe numerical relationships. [A-APR4]