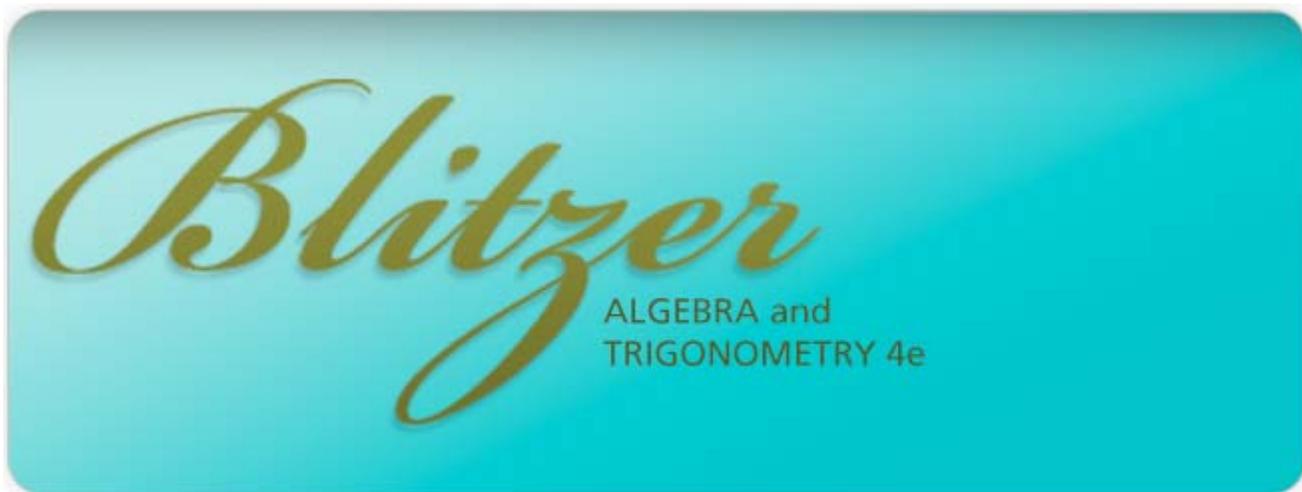A Correlation of

Algebra and Trigonometry
(Blitzer) 4th Edition © 2010

to the

Alabama Course of Study: Mathematics
Analytical Mathematics

Introduction

This document demonstrates how ***Algebra and Trigonometry* (Blitzer) 4th Edition © 2010,** meets the indicators of the Alabama Course of Study: Mathematics Analytical Mathematics. Correlation page references are to the Student Edition and Teacher's Edition and are cited at the page level.

***Algebra and Trigonometry* (Blitzer) 4th Edition © 2010** gets students engaged and keeps them engaged. Presenting the full scope of the mathematics is just the first step. Blitzer draws students in with vivid applications that use math to solve real-life problems. These applications help answer the question "When will I ever use this?" Students stay engaged because the book helps them remain focused as they study. The three-step learning system–See It, Hear It, Try It–makes examples easy to follow, while frequent annotations offer the support and guidance of an instructor's voice. Every page is interesting and relevant, ensuring that students will actually use their textbook to achieve success

Fourth Edition Features:
New Applications and Real-World Data   263 worked-out examples and application exercises based on new data sets including models that describe changing attitudes of college students over time.

"Make Sense?" Classroom Discussion Exercises   Each exercise set contains four Critical Thinking exercises intended for classroom discussion in order to engage participation in the learning process.

New Direction for the True/False Critical Thinking Exercises   The Fourth Edition asks students to determine whether each statement in an itemized list is true or false. If the statement is false, students are then asked to make the necessary change or changes to produce a true statement.

Preview Exercises   Each exercise set concludes with three problems to help students prepare for the next section.

More Detailed Directions When Comparing Mathematical Models with Actual Data   The Fourth Edition asks students if values obtained from mathematical models underestimate or overestimate data displayed by graphs, and if so, by how much.

Increased Study Tip Boxes   The book's Study Tip boxes offer suggestions for problem solving, point out common errors to avoid, and provide informal hints and suggestions.

New Chapter-Opening and Section-Opening Scenarios   Every chapter and every section open with a scenario based on an application. These scenarios are revisited in the course of the chapter or section in one of the book's new examples, exercise or discussions.

840 New Examples and Exercises   The Fourth Edition contains 24 detailed worked-out examples involving new data, 239 new application exercises, 308 "Make Sense?" discussion exercises, 228 preview exercises, and 41 new exercises that appear in the various other categories of exercise sets.

This document demonstrates the success students will achieve using ***Algebra and Trigonometry* (Blitzer).**

ANALYTICAL MATHEMATICS
Analytical Mathematics is a course designed for students who have successfully completed the Algebra II With Trigonometry course. It is considered to be parallel in rigor to Precalculus. This course provides a structured introduction to important areas of emphasis in most postsecondary studies that pursue a concentration in mathematics. Linear algebra, logic, vectors, and matrices are topics that are given more in-depth coverage than in previous courses. Application-based problem solving is an integral part of this course. To assist students with numerical and graphical analysis, the use of advanced technological tools is highly recommended.

NUMBER AND QUANTITY

Vector and Matrix Quantities

Represent and model with vector quantities.

Alabama Course of Study: Mathematics Analytical Mathematics	Algebra and Trigonometry (Blitzer) 4/e
1. (+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., **v**, $\|v\|$, $\|\|v\|\|$), including the use of eigen-values and eigen-vectors. [N-VM1]	**SE/TE:** 718—723
2. (+) Solve problems involving velocity and other quantities that can be represented by vectors, including navigation (e.g., airplane, aerospace, oceanic). [N-VM3]	**SE/TE:** 727—728, 730—731, 739—740
3. (+) Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes. Find the dot product and the cross product of vectors. [N-VM4a]	**SE/TE:** 723—725, 733—734, 736, 738—739
4. (+) Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum, including vectors in complex vector spaces. [N-VM4b]	**SE/TE:** 727—728, 730
5. (+) Understand vector subtraction **v** – **w** as **v** + (–**w**), where (–**w**) is the additive inverse of **w**, with the same magnitude as **w** and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise, including vectors in complex vector spaces. [N-VM4c]	**SE/TE:** 721, 723—725, 729—731

Perform operations on matrices and use matrices in applications.

6. (+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network, including linear programming. [N-VM6]	**SE/TE:** 822, 843, 856—857
7. (+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled, including rotation matrices. [N-VM7]	**SE/TE:** 846—847
8. (+) 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. Solve matrix equations using augmented matrices. [N-VM10]	**SE/TE:** 822, 859—861

SE = Student Edition   TE = Teacher Edition

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9. (+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors, including matrices larger than 2×2. [N-VM11]	The opportunity to introduce this objective is available. See the following: pages **SE/TE:** 853—854, and 856
10. (+) Work with 2×2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area. Solve matrix application problems using reduced row echelon form. [N-VM12]	**SE/TE:** 853—854, 856
Complex Numbers	
Use complex numbers in polynomial identities and equations.	
11. (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials. Understand the importance of using complex numbers in graphing functions on the Cartesian or complex plane. [N-CN9]	**SE/TE:** 358
Limits	
Understand limits of functions.	
12. Calculate the limit of a sequence, of a function, and of an infinite series. Not included	
ALGEBRA	
Seeing Structure in Expressions	
13. Use the laws of Boolean Algebra to describe true/false circuits. Simplify Boolean expressions using the relationships between conjunction, disjunction, and negation operations.	The opportunity to introduce this standard appears throughout the text after page 3.
14. Use logic symbols to write truth tables.	The opportunity to introduce this standard appears throughout the text after page 3.
Arithmetic With Polynomials and Rational Functions	
15. Reduce the degree of either the numerator or denominator of a rational function by using partial fraction decomposition or partial fraction expansion.	**SE/TE:** 772—780, 781—782
FUNCTIONS	
Trigonometric Functions	
Extend the domain of trigonometric functions using the unit circle.	
16. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions. [F-TF4].	**SE/TE:** 539—532, 534
Apply trigonometry to general triangles.	
17. (+) Prove the Law of Sines and the Law of Cosines and use them to solve problems. Understand Law of Sines = $2r$, where r is the radius of the circumscribed circle of the triangle. Apply the Law of Tangents. [G-SRT10]	**SE/TE:** 671, 672—675, 676—680, 681—683, A-2
18. Apply Euler's and deMoivre's formulas as links between complex numbers and trigonometry.	**SE/TE:** 706—709, 711—715, 716, A-3

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