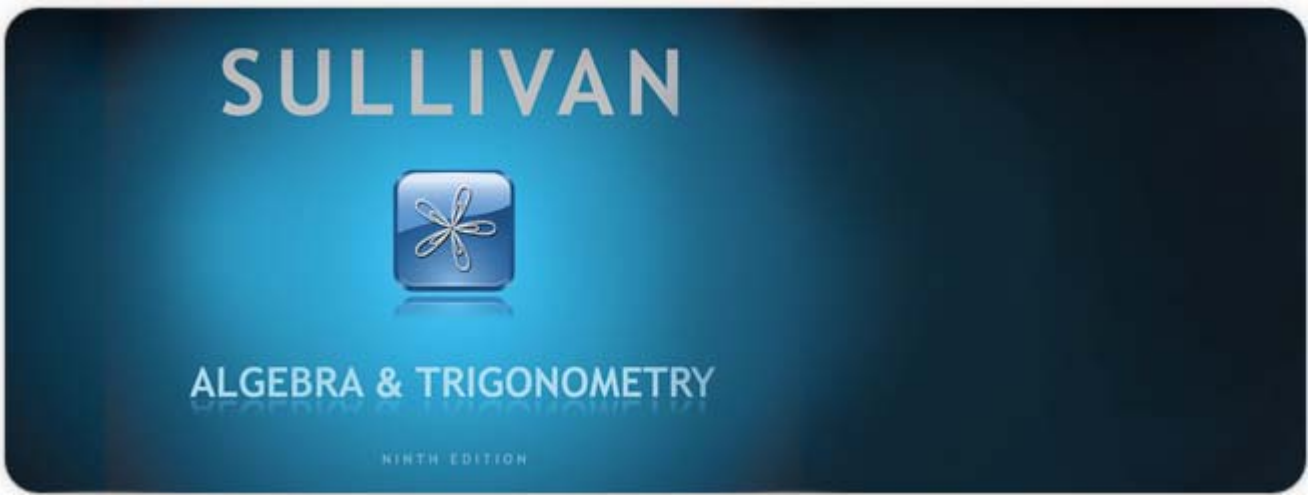
A Correlation of

Algebra and Trigonometry
Sullivan, 9th Edition



to the

Alabama Course of Study: Mathematics
Analytical Mathematics

ALWAYS LEARNING PEARSON

Introduction

This document demonstrates how ***Algebra & Trigonometry*** **(Sullivan) 9th Edition © 2012,** 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.

Mike Sullivan's time-tested approach focuses students on the fundamental skills they need for the course: *preparing* for class, *practicing* with homework, and *reviewing* the concepts. In this ninth edition, **Algebra & Trigonometry** has evolved to meet today's course needs, building on these hallmarks by integrating projects and other interactive learning tools for use in the classroom or online.

New Internet-based Chapter Projects apply skills to real-world problems and are accompanied by assignable MathXL exercises to make it easier to incorporate these projects into the course. In addition, a variety of new exercise types, Showcase Examples, and video tutorials for MathXL exercises give instructors even more flexibility, while helping students build their conceptual understanding.

New to the Ninth Edition

Chapter Projects, which apply the concepts of each chapter to a real-world situation, have been enhanced to give students an up-to-the-minute experience.

Author Solves It MathXL Video Clips – author Michael Sullivan works by section through MathXL exercises typically requested by students for more explanation or tutoring.

Showcase Examples are used to present examples in a guided, step-by-step formata.

Model It examples and exercises are meant to develop the student's ability to build models from both verbal descriptions and data.

Exercise Sets at the end of each section remain classified according to purpose.

This document demonstrates the success students will achieve using ***Algebra & Trigonometry*** **(Sullivan).**

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 & Trigonometry (Sullivan) 9/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:** 749—750, 752—753
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:** 757—759, 761—763, 767—768, 769—775
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:** 750—751, 754—755, 760, 763—764
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:** 758—759, 762
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: 8**751—752, 754—755
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:** 883, 887—896
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:** 885—886
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:** 859—868, 885, 890—893

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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]	**SE/TE:** 887
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:** 865—869, 871—872
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:** 388—390
Limits	
Understand limits of functions.	
12. Calculate the limit of a sequence, of a function, and of an infinite series.	**SE/TE:** 331, 337, 344—345, 354, 357, 360
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.	**SE/TE:** 23, 15, 982—983, 986
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:** 899—905
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:** 556—558
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 = 2*r*, where *r* is the radius of the circumscribed circle of the triangle. Apply the Law of Tangents. [G-SRT10]	**SE/TE:** 678—688, 689—695
18. Apply Euler's and deMoivre's formulas as links between complex numbers and trigonometry.	**SE/TE:** 745—747, 748—749