Transition to College Math

Syllabus

Primary Textbook

Burger, Edward E., David J Chard, Paul A Kennedy, Steven L. Leinwand, Freddie L. Renfro, Tom W. Robby, Bert K Waits. *Algebra 2*. Orlando, FL: Holt McDougal, 2012.

Technology

- All students have a scientific or a graphing calculator for use in class and at home. These calculators may be a scientific calculator app on a smart phone. They will use scientific calculators throughout the course.
- The teacher will use a TI-84 calculator emulator projected on a screen in the classroom as an aid to understanding.

Course Description

This course is an extension to Algebra 2. It will present advanced algebra to the students. Student learning will rely heavily on collaboration and discussion among students. These collaborations and discussions will take place within small groups and the class as a whole. The teacher will guide these collaborations and discussions.

Course Outline

The course is an extension of the material taught in Algebra 2. It will be organized in units. Most of these units correspond to chapters in the primary textbook. However, significant material will be drawn from other sources. The activities and goals for each unit are listed below.

Unit 1 — Sequences and Series (5 weeks)

Activities:

- MARS Formative Assessment: Manipulating Polynomials
- Technology Lab: Evaluating Sequences and Series
- Algebra Lab: Exploring Infinite Geometric Series

Learning Goals:

- Learn to write rules for sequences
- Evaluate the sum of a series

- Find sums of infinite geometric series

Unit 2 — Matrices and Vectors (4 weeks)

Activities:

- MARS Formative Assessment: Representing and Combining Transformations
- Spreadsheet Lab: Organizing Data with Matrices
- Graphing Technology Lab: Operations with Matrices

Learning Goals:

- Analyze data in matrices
- Understand the properties of matrix multiplication
- Write and solve matrix equations for a system of equations

Unit 3 — Conic Sections (6 weeks)

Activities:

- Algebra Lab: Locate the foci of an ellipse
- MARS Formative Assessment: Equations of Circles

Learning Goals:

- Recognize conic sections as intersections of planes and cones.
- Use distance and midpoint formulas to solve problems
- Write equations for conic sections
- Identify the key features of conic sections

Unit 4 — Trigonometric Functions (5 weeks)

Activities:

- Technology Lab: Explore the unit circle
- MARS Formative Assessment: Ferris Wheel

Learning Goals:

- Understand and use trigonometric relationships in right triangles to solve problems
- Determine the values of trigonometric functions in standard position
- Understand angle measures in radians
- Find the values of trigonometric functions on the unit circle
- Understand and use inverse trigonometric functions
- Understand and use the laws of sines and cosines

Unit 5 — Trigonometric Identities (5 weeks)

Activities:

- Technology Lab: Graph Trigonometric Identities

Learning Goals:

- Recognize and graph periodic and trigonometric functions
- Use fundamental trigonometric identities
- Solve equations involving trigonometric functions

Unit 6 — Probability (5 weeks)

Activities:

- Connecting Algebra to Geometry: Relative Area
- MARS Formative Assessment: Modeling Conditional Probabilities 1: Lucky Dip
- MARS Formative Assessment: Modeling Conditional Probabilities 2

Learning Goals:

- Solve problems involving the Fundamental Counting Principle
- Understand how to find the theoretical and experimental probability of an event
- Determine whether events are independent or dependent, and find the probability of independent or dependent events.