

MAT2100_202338_Staging_OAEN_TEM

MAT-2100

2023 05/01/2023 to 04/30/2024 Modified 03/28/2023

Course Description

This semester-long course is designed to take the student through a basic review of algebra and applicable geometry and present a detailed study of trigonometric identities. The student will study topics on graphs and functions, the law of sines and law of cosines, vectors, complex numbers, and polar coordinates. The student will explore conic sections, exponential and logarithmic functions, and inverse trigonometric functions. The subject matter will be presented through video lectures and daily practice, and students will view mathematical principles in the light of biblical truth.

Rationale

Trigonometry builds on geometric properties and algebraic principles learned in geometry and Algebra II and takes students to a higher level. By exploring the uses of sines and cosines, practical applications involving vectors and matrices can be used to make math a tool for solving problems beyond simple four-operation calculations.

Course Learning Outcomes

- A. The student will explore exponential and radical expressions and factor polynomials with an emphasis on both real and imaginary roots.
- B. The student will identify functions based on given properties including transformations, combinations, and inverse functions.
- C. The student will work with angles including right angle trigonometric functions and identities.
- D. The student will graph trigonometric functions and explore real life applications of trigonometric functions.
- E. The student will evaluate trigonometric equations using trigonometric identities and special formulas.
- F. The student will use the laws of sines and cosines and solve for roots of complex numbers, vectors and conic sections.
- G. The student will explore polar coordinates, solve polar equations and parametric equations with graphing on the polar coordinate plane.

Course Resources

See Ember's [Systems Requirements](#) for computer specifications necessary to operate this curriculum.

- Note: Embedded YouTube videos may be utilized to supplement Ember's YouTube videos are the property of the respective content creator, licensed to YouTube for distribution and user access. As a non-profit educational institution, Ember is able to use YouTube video content under the YouTube Terms of Service. For additional information on copyright, please contact the [Jerry Falwell Library](#)

Course Policies

Types of Assessments

To simplify and clearly identify which policies apply to which assessment, each assessment has been categorized into one of four categories: Lesson, Assignment, Quiz, or Test. Each applicable item on the course Modules page has been designated with an identifier chosen from among these categories. Thus, a Quiz on the American Revolution may be designated by the title, "1.2.W *Quiz*: The American Revolution."

- **Lesson:** *Any item on the Modules page designated as a "Lesson"*

These include instructional content and sometimes an assessment of that content. Typically, a Lesson will be the day-to-day work that a student completes.

- **Assignment:** *Any item on the Modules page designated as an "Assignment"*

Typical examples of Assignments include, but are not limited to, papers, book reports, projects, labs, and speeches. Assignments are usually something that the student should do his or her best work on the first time.

- **Quiz:** *Any item on the Modules page designated as a "Quiz"*

This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Quizzes cover a smaller amount of material than Tests.

- **Test:** *Any item on the Modules page designated as a "Test"*

This usually takes the form of a traditional assessment where the student will answer questions to demonstrate knowledge of the subject. Tests cover a larger amount of material than Quizzes.

Materials Selection Policy

Ember curates educational materials that are consistent with the school's philosophy; however, the fallen human condition depicted in literature (as in Scripture itself) is not always pleasant. Valuable works sometimes have objectionable or profane elements. Good books provide four (4) recognized values.

- They build godly attitudes and character traits.
- They deepen our social and cultural awareness.
- They strengthen our use of written language.
- They provide a lifelong source of enjoyment and relaxation.

In order to instill these values in students and fulfill the stated objectives of the school, all Ember students are expected to read and study good books on a regular basis. Recognizing that materials designed for one level may not be appropriate for another, three (3) levels of criteria are applied:

- Elementary materials must contain no objectionable material,
- Objectionable elements in sixth through eighth-grade materials must be limited and must serve a specific educational purpose, and
- Objectionable content may be included in high school materials but must be outweighed by positive literary, curricular, and/or Christian values.

The curriculum department has approved required educational materials for students.

Resubmission Policy

Students are expected to submit their best work on the first submission for every Lesson, Assignment, Quiz, and Test. However, resubmissions may be permitted in the following circumstances:

- **Lesson:** Students are automatically permitted two attempts on a lesson. Students may freely resubmit for their first two attempts without the need for teacher approval.

If a student feels that he or she deserves a resubmission on a Lesson, Assignment, Quiz, or Test due to a technical issue such as a computer malfunction, the student should message his or her teacher to make the request. With Ember, the teacher may be a physical school teacher or the student's parent/guardian. The teacher can give another attempt from his or her Canvas account. For more information on how to do this, please review the Ember orientation course.

Schedule

Module 1: Polynomials, Equations, & Functions

- Week 1: Exponents & Roots
- Week 2: Factoring Polynomials
- Week 3: Rational Expressions & Solving Equations
- Week 4: Functions

Module 2: Inverse Functions, Angles, & the Unit Circle

- Week 5: Transforming Functions, Combining Functions, & Inverse Functions
- Week 6: Angles & Circles
- Week 7: The Unit Circle & Graphing Sine & Cosine
- Week 8: The Other Trigonometric Functions
- Week 9: Inverse Trigonometric Functions

Module 3: Right Triangle Trigonometry & Trigonometric Identities

- Week 10: Right Triangle Trigonometry
- Week 11: The Trigonometric Identities
- Week 12: The Sum, Difference, Double-Angle & Half-Angle Formulas

Module 4: Law of Sines & Cosines, & Vectors

- Week 13: The Law of Sines & the Law of Cosines
- Week 14: Vectors
- Week 15: Complex Zeros & Trigonometric Form of Complex Numbers
- Week 16: Polar Coordinates, Polar Equations, & Parametric Equations

Module 5: Conics

- Week 17: Conic Sections
- Week 18: Review & Quarter Exam