

MATH 119 Precalculus Trigonometry

1. Catalog Description

MATH 119. Precalculus Trigonometry 4 units

GE Area B1

Prerequisite: Completion of ELM requirement and passing score on appropriate

Mathematics Placement Examination, or MATH 117, or MATH 118.

Rectangular and polar coordinates. Trigonometric functions, fundamental identities.

Inverse trigonometric functions and relations. Vectors, complex numbers, conic sections, and analytic geometry. Not open to students with credit in MATH 141, MATH 161, or MATH 221. 4 lectures. Fulfills GE B1; for students admitted Fall 2016 or later, a grade of C- or better in one GE B1 course is required to fulfill GE Area B.

2. Required Background or Experience

Math 118 or equivalent.

3. Learning Objectives

The student should:

- a. Understand the trigonometric functions as developed from both a right triangle and a circle.
- b. Apply trigonometric functions to simple problems involving the geometry of triangles and circles, vectors, and periodic phenomena.
- c. Derive basic trigonometric identities and use them to manipulate expressions involving trigonometric functions.
- d. Graph with facility equations similar to $y = A \sin(Bx + C)$ and combinations thereof.
- e. Understand and be able to manipulate the inverse trigonometric functions and use them to solve trigonometric equations.
- f. Understand analytic geometry and the polar form of the conic sections.

4. Text and References

- Stewart, Precalculus 7th edition, 2016, customized for Cal Poly, Cengage.

5. Minimum Student Materials

Paper, pencils, and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for demonstration and class use.

7. Content and Method

Topic Lectures

Chapter 2: Functions (Review) 2

2.7: Combining Functions

2.8: One-to-One Functions and Their Inverses

Chapter 5: Trigonometric Functions: Unit Circle Approach 8

5.1: The Unit Circle

5.2: Trigonometric Functions of Real Numbers

5.3: Trigonometric Graphs

5.4: More Trigonometric Graphs

5.5: Inverse Trigonometric Functions and Their Graphs

5.6: Modeling Harmonic Motion

5: Focus on Modeling

Chapter 6: Trigonometric Functions: Right Triangle Approach 4

6.1: Angle Measure

6.5: The Law of Sines

6.6: The Law of Cosines

6: Focus on Modeling

Chapter 7: Analytic Trigonometry 7

7.1: Trigonometric Identities

7.2: Addition and Subtraction Formulas

7.3: Double-Angle, Half-Angle, and Product-Sum Formulas

7.4: Basic Trigonometric Equations

7: Focus on Modeling

Chapter 8: Polar Coordinates and Parametric Equations 7

8.1: Polar Coordinates

8.2: Graphs of Polar Equations

8.3: Polar Form of Complex Numbers; De Moivre's Theorem

8.4: Plane Curves and Parametric Equations

8: Focus on Modeling

Chapter 11: Conic Sections 6

11.1: Parabolas

11.2: Ellipses

11.3: Hyperbolas

11.4: Shifted Conics

11.5: Rotation of Axes
11.6: Polar Equations of Conics (lightly)
11: Focus on Modeling

Total 34

8. Methods of Assessment

The primary methods of assessment are: essay examinations, quizzes and homework. Typically, there will be one or more hour-long examinations during the quarter, and a required comprehensive final examination.