



Ephrata High School
Course Syllabus
Pre-Calculus
3210



I. Course Description

Pre-Calculus Mathematics is designed for the student who plans to study mathematics or mathematics-related fields in college or technical school or who has a special interest and high ability in mathematics. The course emphasizes the study of trigonometry, analytical geometry, sequences and series, elementary functions and their graphs, and a variety of other mathematical topics. The course provides the student with strong background in algebra, geometry, analysis, and trigonometry, which is necessary for the study of calculus.

II. Materials & Equipment

Precalculus with Limits – A Graphing Approach – Houghton Mifflin Co. – 2001
TI – 83+/TI – 84+ graphing calculator

III. Course Goals & Objectives

Enduring Understandings: Students will understand how to

- Define relations, functions, and state the domain and range of a function.
- Graph relations.
- Identify relative maxima and minima using graphing utilities.
- Define even and odd functions.
- Transform graphs.
- Define and sketch inverse functions.
- Apply quadratic and higher degree functions.
- Calculate roots of polynomial functions.
- Define complex numbers.
- Apply the Fundamental Theorem of Algebra.
- Apply concept of asymptotes to graphs of rational functions.
- Graph and apply exponential and logarithmic functions.
- Define radians and convert radian and degree measures.
- Define and apply reference angles.
- Define trigonometric functions on the unit and other circles.
- Graph and transform trigonometric functions.
- Calculate exact values of trigonometric functions.
- Define trigonometric functions in right triangles.
- Model real world situations using right triangle trigonometry.
- Use fundamental trigonometric functions to verify other identities.
- Simplify trigonometric expressions.
- Solve trigonometric equations graphically and algebraically.
- Apply the sum, difference, and double angle identities.
- Model real world situations using the Law of Sines and the Law of Cosines.
- Calculate the n 'th terms and n 'th partial sums of arithmetic and geometric sequences and series.
- Apply concept of limit to sequence and series.
- Define and identify convergent and divergent series.
- Calculate the sum of convergent series.
- Prove theorems by induction.
- Calculate limits of functions.

IV. Course Topics

I. Functions and Their Graphs

- Define and graph functions.

II. Polynomial and Rational Functions

- Graph polynomial functions.

III. Exponential and Logarithmic Functions

- Graph and apply exponential functions.

IV. Trigonometric Functions

- Define trigonometric functions.
- Graph trigonometric functions.

V. Analytic Trigonometry

- Apply trigonometric functions.

VI. Sequences, Series, and Probability

- Apply sequences and series.
- Utilize probability and statistics principles.
- Prove theorems by induction.

Limits and an Introduction to Calculus

- Calculate limits.

V. Assignments & Grading

Homework will be assigned on a daily basis. Grades will be based on quizzes and tests. In addition, teachers may use homework, group activities, and/or projects for grading purposes. All students will take departmental mid-year and final exams. The Ephrata High School grading system and scale will be used to determine letter grades.