

Textbook Information

Math 143 EN – PreCalculus Mathematics

Fall 2017

Lecture Notes, Worksheets

Most topics covered in the class will be presented via handouts. These will be available at the [class's web site](#), as pdf files. All students must monitor the class's web site for handouts and announcements.

Textbook

Starting at the fall semester of 2017, the Mathematics Department is using an open source textbook. This means that the textbook is available for free as a pdf download and the printed version at a reasonable price (approximately \$58) at the link <https://openstax.org/details/books/precalculus>. All students must have the free pdf of the textbook, but the course will not be closely following the text. It is NOT recommended that students purchase the physical copy. The pdf file should be sufficient.

Online Homework

Homework will be assigned on MyOpenMath, an open source online platform. The use of MyOpenMath is completely free, and students can register at <https://www.myopenmath.com>. The use of MyOpenMath will be mandatory in the class.

Contents of Textbook

Chapter 1 – Functions

- 1.1 Functions and Function Notation
- 1.2 Domain and Range
- 1.3 Rates of Change and Behavior of Graphs
- 1.4 Composition of Functions
- 1.5 Transformation of Functions
- 1.6 Absolute Value Functions
- 1.7 Inverse Functions
- Chapter Review, Review Exercises, and Practice Test

Chapter 2 – Linear Functions

- 2.1 Linear Functions
- 2.2 Graphs of Linear Functions
- 2.3 Modeling with Linear Functions
- 2.4 Fitting Linear Models to Data
- Chapter Review, Review Exercises, and Practice Test

Chapter 3 – Polynomial and Rational Functions

- 3.1 Complex Numbers
- 3.2 Quadratic Functions
- 3.3 Power Functions and Polynomial Functions
- 3.4 Graphs of Polynomial Functions
- 3.5 Dividing Polynomials
- 3.6 Zeros of Polynomial Functions
- 3.7 Rational Functions
- 3.8 Inverses and Radical Functions
- 3.9 Modeling Using Variation
- Chapter Review, Review Exercises, and Practice Test

Chapter 4 – Exponential and Logarithmic Functions

- 4.1 Exponential Functions
- 4.2 Graphs of Exponential Functions
- 4.3 Logarithmic Functions
- 4.4 Graphs of Logarithmic Functions
- 4.5 Logarithmic Properties
- 4.6 Exponential and Logarithmic Equations
- 4.7 Exponential and Logarithmic Models
- 4.8 Fitting Exponential Models to Data
- Chapter Review, Review Exercises, and Practice Test

Chapter 5 – Trigonometric Functions

- 5.1 Angles
- 5.2 Unit Circle: Sine and Cosine Functions
- 5.3 The Other Trigonometric Functions
- 5.4 Right Triangle Trigonometry
- Chapter Review, Review Exercises, and Practice Test

Chapter 6 – Periodic Functions

- 6.1 Graphs of the Sine and Cosine Functions
- 6.2 Graphs of the Other Trigonometric Functions
- 6.3 Inverse Trigonometric Functions
- Chapter Review, Review Exercises, and Practice Test

Chapter 7 – Trigonometric Identities and Equations

- 7.1 Solving Trigonometric Equations with Identities
- 7.2 Sum and Difference Identities
- 7.3 Double-Angle, Half-Angle, and Reduction Formulas
- 7.4 Sum-to-Product and Product-to-Sum Formulas
- 7.5 Solving Trigonometric Equations
- 7.6 Modeling with Trigonometric Equations
- Chapter Review, Review Exercises, and Practice Test

Chapter 8 – Further Applications of Trigonometry

- 8.1 Non-right Triangles: Law of Sines
- 8.2 Non-right Triangles: Law of Cosines
- 8.3 Polar Coordinates
- 8.4 Polar Coordinates: Graphs
- 8.5 Polar Form of Complex Numbers
- 8.6 Parametric Equations
- 8.7 Parametric Equations: Graphs
- 8.8 Vectors
- Chapter Review, Review Exercises, and Practice Test

Chapter 9 – Systems of Equations and Inequalities

- 9.1 Systems of Linear Equations: Two Variables
- 9.2 Systems of Linear Equations: Three Variables
- 9.3 Systems of Nonlinear Equations and Inequalities: Two Variables
- 9.4 Partial Fractions
- 9.5 Matrices and Matrix Operations
- 9.6 Solving Systems with Gaussian Elimination
- 9.7 Solving Systems with Inverses
- 9.8 Solving Systems with Cramer's Rule
- Chapter Review, Review Exercises, and Practice Test

Chapter 10 – Analytic Geometry

- 10.1 The Ellipse
- 10.2 The Hyperbola
- 10.3 The Parabola
- 10.4 Rotation of Axis
- 10.5 Conic Sections in Polar Coordinates
- Chapter Review, Review Exercises, and Practice Test

Chapter 11 – Sequences, Probability and Counting Theory

- 11.1 Sequences and Their Notations
- 11.2 Arithmetic Sequences
- 11.3 Geometric Sequences
- 11.4 Series and Their Notations
- 11.5 Counting Principles
- 11.6 Binomial Theorem
- 11.7 Probability
- Chapter Review, Review Exercises, and Practice Test

Chapter 12 – Introduction to Calculus

- 12.1 Finding Limits: Numerical and Graphical Approaches
- 12.2 Finding Limits: Properties of Limits
- 12.3 Continuity
- 12.4 Derivatives
- Chapter Review, Review Exercises, and Practice Test