

MA1323 Trigonometry Outline **Fall 2007**

Book: Trigonometry; Coburn

Introduction to Trigonometry, sections 1.1 (4 hours)

- Section 1.1 A. Angle Measure in Degrees
 - Complementary and Supplementary Angles
 - Conversions of DMS to DD
- Section 1.1 B. Triangles and properties of Triangles
 - 45-45-90 and 30-60-90 triangles.
- Section 1.1 C. Angle Measure in Radians: Arc length and Area.
- Section 1.1 D. converting Between Degrees and Radians

Trigonometry of Right Angles, section 1.2 (4 hours)

- Section 1.2 A. Trigonometric Ratios and Their Values.
 - Right Triangle Trig Definitions
- Section 1.2 B. Solving Right Triangles Given One Angle and One Side
- Section 1.2 C. Solving right Triangles Given Two Sides
- Section 1.2 D. Using Cofunctions and Complements to Write Equivalent Expressions.
- Section 1.2 E. Applications Using angles of Elevation/Depression

Trigonometry and the Coordinate Plane, section 1.3 (2 hours)

- Section 1.3 A. Define the trigonometric functions using the coordinates of a point in Q1
- Section 1.3 B. Reference Angles and Trig Function of any angle

Unit Circles and the Trigonometry of Real Numbers, section 1.4 (3 hours)

- Section 1.4 A. The Unit Circle
- Section 1.4 B. Standard Triangles and the Unit Circle
- Section 1.4 C. Trigonometric Functions and Points on the Unit Circle
- Section 1.4 D. The trig of Real Numbers.
- Section 1.4 E. Finding a real Number t Whose Function Value in Known.

Graphs of the Sine and Cosine Functions, section 2.1 (3 hours)

- Chapter 2.1 A. and B. Graphs of the Sine and Cosine Function.
- Section 2.1 C. Amplitude and Period
- Section 2.1 D. Graphs of the cosecant and Secant
- Chapter 2.1 E. Writing Equations from Graphs

Graphs of the Tangent and Cotangent Functions, section 2.2(2hours)

- Section 2.2 A. Graph of tangent.
- Section 2.2 B. Graph of Cotangent.
- Section 2.2 C Characteristics of tangent and cotangent.
- Section 2.2 D. How A and B affect the vertical stretches and Compressions

Transformations and Applications of Trigonometric Graphs (1 hour)

- Section 2.3 A. Vertical Translations
- Section 2.3 B. Horizontal Translations

Fundamental Identities and Families of Identities, section 3.1 (6 hours)

- Section 3.1
 - A. Fundamental Identities and Identity Families
 - B. Verify an Identity Using Algebra
 - C. Writing One Function in Terms of another
- Section 3.3
 - A. The Sum and difference Identities for Cosine
 - B. The Cofunction identities and Angel Reduction Formulas
 - C. The Sum and difference Identities for Sine and Tangent
- Section 3.4:
 - A. The Double-Angle Identities
- Section 3.4
 - B. The Power Reduction and Half-Angle Identities

One-to-One and Inverse Functions (5 hours)

- Section 4.2
 - A. The inverse Sine Function
 - B. The inverse Cosine and Tangent Functions
- Section 4.2
 - C. Evaluate Compositions
 - Section 4.3 Solving Basic Trig Equations
 - A. The principal Root
 - B. Inverse Functions and Principal Roots
- Section 4.3
 - C. Solving Trig Equations for Roots [0,360degrees)
 - D. Solving Trig Eq for all real roots
 - E. Trig Equations and Trig Identities
- Section 4.4
 - A. Trig Equations and Algebraic Methods

Oblique Triangles and the Law of Sines, Law of Cosines, section 5.1-5.3 (5 hours)

- Section 5.1
 - A. The Law of Sines
 - B. Unique Triangles: AAS or ASA
 - C. applications
- Section 5.2
 - A. The Ambiguous Case of the Law of Sines
 - B. Scaled Drawings
 - C. Applications
- Section 5.3
 - A. The Law of Cosines
 - B. SAS
 - C. SSS
 - D. Applications

Vectors and Vector Diagrams, section 5.4 (2 hours)

- A. The Notation and Geometry of Vectors
- B. vectors and the Coordinate Grid
- C. Operations on Vectors and Vector Properties

Complex Numbers, section 5.6 (3 hours)

- Section 5.6 complex Numbers
- Adding and Subtracting
- Multiplying : powers of i
- Division of complex Numbers
- Section 5.7 Graphing Complex Numbers
- Complex Numbers in Trig Form
- Converting from trig form to rectangular form
- Products and Quotients Geometrically
 - A. Products and Quotients in Trig Form

Four one hour tests (4 hours)

Review for final exam 1 hour

Total 45 Hours

On this syllabus there are 34 to 39 MWF days allotted for instruction on the text material. An additional 2 days are suggested for instruction in the use of the calculator. A graphing calculator is no longer required, but a scientific calculator is necessary. Also, instructors may feel free to use a graphing calculator during class time for demonstration purposes. Applications are to be emphasized in all areas.

Since the fall and spring semesters normally contain 43 class hours on a MWF schedule and the summer terms 42 hours, this leaves ample time for review and testing. It is suggested that three or four one-hour tests should be administered each semester in addition to a comprehensive final examination.