TRIGONOMETRY
MATH 1330

Course Description:

This course introduces elements of plane trigonometry, including trigonometric and circular functions, inverse trigonometric functions, solutions of triangles, identities and conditional equations, vectors, complex numbers, and conic sections.

Prerequisites:

ACT Math at least 23, Math SAT at least 540, or Math SAT2016 at least 570 within last 2 years; or Accuplacer at least 5 or COMPASS at least 4 within last 2 years; or MATH 1320 with at least C- within last 2 years; or MATH 1330 within last 2 years

Overview of content and purpose of the course:

Trigonometry has applications to many scientific fields such as acoustics, engineering, geodesy, medical imaging, oceanography, physics, and seismology. Trigonometry is an essential building block of Calculus, which makes it important when studying other areas of Mathematics such as Differential Equations, Linear Algebra, Number Theory, Probability Theory, and Statistics. Every Math major needs a strong understanding of Trigonometry.

Major topics:

1) Trigonometric Functions
- a. Angles
- b. Angle Relationships and Similar Triangles
- c. Trigonometric Functions
- d. Using the Definitions of the Trigonometric Functions

2) Acute Angles and Right Triangles
- a. Trigonometric Functions of Acute Angles
- b. Trigonometric Functions of Non-Acute Angles
- c. Finding Trigonometric Function Values Using a Calculator
- d. Solving Right Triangles
- e. Further Applications of Right Triangles

3) Radian Measure and the Unit Circle
- a. Radian Measure
- b. Applications of Radian Measure
- c. The Unit Circle and Circular Functions
- d. Linear and Angular Speed

4) Graphs of the Circular Functions

a. Graphs of the Sine and Cosine Functions
b. Translations of the Graphs of the Sine and Cosine Functions
c. Graphs of the Tangent and Cotangent Functions
d. Graphs of the Secant and Cosecant Functions

5) Trigonometric Identities

a. Fundamental Identities
b. Verifying Trigonometric Identities
c. Sum and Difference Identities for Cosine
d. Sum and Difference Identities for Sine and Tangent
e. Double-Angle Identities
f. Half-Angle Identities

6) Inverse Circular Functions and Trigonometric Equations

a. Inverse Circular Functions
b. Trigonometric Equations I
c. Trigonometric Equations II
d. Equations Involving Inverse Trigonometric Functions

7) Applications of Trigonometry and Vectors

a. Oblique Triangles and the Law of Sines
b. The Ambiguous Case if the Law of Sines
c. The Law of Cosines
d. Vectors, Operations, and the Dot Product
e. Applications of Vectors

8) Complex Numbers, Polar Equations, and Parametric Equations

a. Complex Numbers
b. Trigonometric (Polar) form of Complex Numbers
c. The Product and Quotient Theorems
d. De Moivre's Theorem: Powers and Roots of Complex Numbers
e. Polar Equations and Graphs
f. Parametric Equations, Graphs, and Applications

9) Analytic Geometry

a. Parabolas
b. Ellipses
c. Hyperbolas
d. Summary of the Conic Sections

Textbook:

Math 1330 Trigonometry Package, Lial Packaging

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