

## Course Outline: Math Lab

- I. Applications of Basic Trig Functions
  - a. Angular Velocity
  - b. Linear Velocity
  - c. Harmonic motion
- II. Advanced Graphing Techniques
  - a. Graphing multiple transformations
  - b. Graphing by addition of ordinates
  - c. Graphing advanced Trig functions
  - d. Graphical representations of Identities
- III. Applications of Solving Triangles
  - a. Advanced angle of Elevation and Depression
  - b. Course and Heading applications
  - c. Applications of Law of tangents
  - d. Heron's Formula and Applications
- IV. Proofs and applications Using Trigonometric Identities
  - a. Basic, Pythagorean, and Negative Angle Identities
  - b. Cosine: Sum and Difference Identities
  - c. Sine: Sum and Difference Identities
  - d. Tangent: Sum and Difference Identities
  - e. Double-Angle Identities
  - f. Half-Angle Identities
  - g. Product/Sum Identities
- V. Inverse Trigonometric Functions
  - a. Solving Advanced Trigonometric Equations
  - b. Solving Multiple Angle Trigonometric Equations: Approximate Solutions
- VI. Polar Coordinates
  - a. Graphs of Advanced Polar equations
  - b. Polar Equations of Conic sections
  - c. Rotation of Axes and graphical applications of rotating the axis
  - d. Advanced Roots of complex numbers
  - e. Advanced Applications of DeMoivre's Theorem
- VII. Applications: Exponential and Logarithmic Equations
- VIII. Solving Advanced systems of Multiple variables
  - a. Determinants
- IX. Applications of Vectors and Dot Products in a Plane
- X. Applications of Power, Logistic, and Trigonometric Functions
- XI. Applications of Hyperbolic Functions