

# **Trigonometry**

## **I. Trigonometric Functions**

- A. Understand the basic terminology of Trigonometry  
Add and Subtract angles in degrees, minutes and seconds.  
Graph angles in standard position  
Find Conterminal Angles
- B. Use similar triangle properties of geometry  
Determine type of triangle by shapes and angles
- C. Define the Six Trigonometric Functions  
Find Function Values for 0, 90, 180, and 270 degrees
- D. Understand the Reciprocal Identities of the Six Trigonometric Functions  
Recognize the signs and ranges of a function value  
Understand the Pythagorean Identities  
Understand the Quotient Identities

## **II. Acute Angles and Right Triangles**

- A. Define the Trigonometric Functions using opposite, adjacent and hypotenuse  
Discover Co-function identities  
Be able to use Special Angles of Trigonometric Functions
- B. Define Reference Angles  
Use Reference Angles to find the Special Angles  
Use Special Angles to find Angle Measures
- C. Find Function Values by using a calculator  
Find Angle Measures by using a calculator
- D. Understand Significant Digits  
Solving triangles by finding all the missing measures using only the given information  
Know how to use Angles of Elevation and Depression
- E. Define Bearings by two methods  
Use Trigonometry to find missing parts of a right triangle in real life applications

## **III. Radian Measure and Circular Functions**

- A. Define  $\pi$  and Learn about Radian Measures  
Converting between Radians and Degrees  
Finding Trigonometric Function Values for angles in Radians
- B. Find the Arc Length of a Circle  
Find the Area of a Sector of a Circle

- C. Understand Circular Functions
  - Evaluating and Finding Values of a Circular Function
  - Finding a Value using its Circular Function Value
  - Applying Circular Functions to real-life situations
- D. Understanding Linear and Angular Speed

#### **IV. Graphs of the Circular Functions**

- A. Understand Periodic Functions
  - Graph Sine and Cosine Functions
  - Understand Amplitude and Period on sine and cosine graphs
  - Be able to use a Trigonometric Model
  - Graph Sine and Cosine functions that have Horizontal and Vertical Translations
  - Determine a Trigonometric Model Using Curve Fitting
- B. Graph Cosecant Functions
  - Graph Secant Functions
  - Graph Tangent Functions
  - Graph Cotangent Functions
  - Addition of Ordinates
- C. Understand and solve problems involving simple harmonic motions
  - Solve problems using Damped Oscillatory Motion

#### **V. Trigonometric Identities**

- A. Understand and solve problems using negative-angle identities
  - Learn and use the Fundamental Identities
- B. Verify Identities by only working with one side
  - Show a technique that could be used by working with both sides
- C. Understand and use the sum and difference identities for cosine
  - Review and use the co-function identities
  - Applying the Sum and Difference Identities
- D. Understand and solve problems using the Sum and Difference Identities for Sine
  - Understand and solve problems using the Sum and Difference Identities for Tangent
  - Apply the Sum and Difference Identities for all trig functions
- E. Understand and Solve problems using Double-Angle Identities
- F. Understand and solve problems using Half-Angle Identities

#### **VI. Inverse Circular Functions and Trigonometric Equations**

- A. Discover the properties of inverse functions
  - Find the inverse functions of sine, cosine, and tangent
- B. Solving trigonometric equations using linear methods, factoring, quadratic methods, and identities
- C. Solving trigonometric equations with half-angles and multiple angles

- D. Solving for  $x$  in terms of  $y$  using Inverse Functions  
Solving Inverse Trigonometric Equations

**VII. Applications of Trigonometry and Vectors**

- A. Solving oblique triangles and real life application problems using the Law of Sines given two angles and the side opposite one of those angles  
Use the Law of Sines area formula to find the area of an oblique triangle
- B. Discovering the Ambiguous Case of the Law of Sines, how to watch for it and then how to solve the oblique triangle when it occurs
- C. Techniques for solving problems involving the Law of Cosines  
Use Heron's formula to find the area of a triangle given 3 sides