

# MATH 15400 Trigonometry

## Course Learning Objectives

The IUPUI Department of Mathematical Sciences has established the following mathematics learning objectives to make clear to students and instructors what knowledge, understanding and skills students should acquire in College Algebra and Trigonometry. In the IUPUI Department of Mathematical Sciences this material is found in the courses MATH 15300 *College Algebra* and MATH 15400 *Trigonometry*.

### Brief Summary of MATH 15400 Learning Objectives

#### 1. Trigonometric Functions

Students understand how trigonometric functions relate to right triangles and solve word problems involving right triangles. They extend the definitions of the trigonometric functions beyond right triangles using the unit circle and they measure angles in radians as well as degrees. They draw and analyze graphs of trigonometric functions (including finding period, amplitude, and phase shift) and use them to solve word problems.

#### 2. Analytic Trigonometry

Students know basic trigonometric identities derived from the definitions and use them to prove other results. In particular, they understand and use the addition, double-angle, and half-angle formulas. They solve trigonometric equations and apply the equations to word problems. They define and graph inverse trigonometric functions and find values of both trigonometric and inverse trigonometric functions.

#### 3. Applications of Trigonometry

Students understand and apply the laws of sines and cosines. They use trigonometry to find the area of a triangle from two sides and the included angle. They use Heron's Formula to find the area of a triangle from three sides. They solve word problems involving oblique triangles.

#### 4. Topics of Analytic Geometry

Students recognize and write equations of conic sections in standard form to find their geometric properties. They graph circles, parabolas, ellipses and hyperbolas. They solve word problems involving conic sections.

#### 5. Systems of Equations

Students graph and solve linear and non-linear systems of equations. They solve applied problems resulting in a system of equations.