MATH 15300 College Algebra
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 15300 Learning Objectives

1. **Fundamental Concepts in Algebra**
   Students recognize and use properties of real numbers. They perform basic arithmetic operations on algebraic expressions and simplify algebraic expressions involving exponents and radicals.
2. **Equations and Inequalities.**
   Students solve linear, quadratic, and other types of equations. They solve applied problems. They perform basic arithmetic operations on complex numbers. They solve linear, polynomial, rational and absolute value inequalities.
3. **Functions and Graphs**
   Students recognize and graph polynomial, algebraic and absolute value functions and use them to solve word problems. They understand the concepts of domain, range, intercept, zero, and asymptote. They perform basic operations on functions like addition, subtraction, multiplication, division and composition. They define and find inverse functions, describe symmetries of graphs and apply transformations to functions.
4. **Logarithmic and Exponential Functions**
   Students define and find inverse functions for both logarithmic and exponential functions. They solve word problems involving exponential and logarithmic functions. They sketch and analyze graphs of exponential and logarithmic functions, including finding domain, range, intercepts and asymptotes.
5. **Polynomial Functions**
   Students sketch the graph of polynomial functions of degree greater than two using a sign diagram and test values. They know and use the Intermediate Value Theorem (IVT). They know and use the Division Algorithm for Polynomials, Remainder Theorem and Factor Theorem. They use long division and synthetic division to find a quotient and remainder and the zeros of a polynomial.