Math 101 - College Algebra

Department of Mathematics
Millersville University

Description

Math 101 is a course for students who need to improve their algebraic skills before taking a higher level course such as Math 130, Math 151, Math 160, or Math 235. It focuses on algebraic topics needed for success in college mathematics, and their applications.

Prerequisites and General Education Credit

Prerequisites are either a C- or better in MATH 090, or Math Placement into MATH 101 prior to registration.

Math 101 does not satisfy any General Education requirement. The credits for the course count toward the 120 credits needed for graduation.

Objectives

In order to complete this course successfully, the student will:

- Demonstrate an understanding of the methods and skills of basic algebra needed to be successful in more advanced math courses. These include:
    - Simplifying and manipulating algebraic expressions.
    - Solving equations and inequalities.
    - Translating word problems into mathematical language.
    - Graphing functions and understanding the relationship between graphs, and algebraic equations, and inequalities.
    - Using logs and exponentials.
- Show by their performance that they have acquired the study habits necessary for success in more advanced math courses.

Course Outline

Topics may be covered in a different order than that listed below at the instructor's discretion, as long as all topics are covered during the course.

Basic Equations and Inequalities

1. Linear equations
2. Absolute value equations
3. Formulas: solving an equation for a variable
4. Applications of linear equations
5. Linear and absolute value inequalities
6. Systems of linear equations
7. Applications of systems of linear equations (Recommended if time permits)

Graphs, Lines, and Functions

1. Equations and graphs of lines
2. Function notation, domain, and range

Integer Exponents and Polynomials

1. Integer exponents
2. Polynomials: addition, subtraction, multiplication, division
3. Factoring: greatest common factor, special forms, trinomials, grouping
4. Solving polynomial equations by factoring

Rational Expressions

1. Rational expressions: addition, subtraction, multiplication, and division, and simplification of complex fractions
2. Solving rational expression equations
3. Applications of rational equations

Fractional Exponents and Radicals

1. Roots and radicals
2. Rational exponents
3. Radical expressions
4. Radical equations
5. Rationalize fractions with radicals in the denominator
6. Complex numbers (Recommended if time permits)

Quadratics

1. Quadratic functions
2. The Quadratic Formula and completing the square
3. Applications of quadratics
4. Equations quadratic in form
5. The graph of a quadratic function
6. Solving quadratic and rational expression inequalities

Functions, Exponential Functions, and Logarithms

1. Functions: composites and inverses
2. Exponential functions
3. Logarithmic functions
4. Common and natural logarithms
5. Solving exponential and logarithmic equations

Recent Texts

Intermediate Algebra (8th edition) by Robert Aufmann and Joanne Lockwood.

The text may be accompanied by online homework.

Revised: January, 2018