

**MOREHOUSE COLLEGE**  
*DEPARTMENT OF MATHEMATICS*

<p><b>Mathematics 051 (Basic Mathematics)</b> <i>Course Description &amp; Objectives</i></p>
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**TEXTBOOK:**        **Intermediate Algebra (6<sup>th</sup> edition)**  
                              **By Jerome E. Kaufmann**

Topics to be covered

1. Basic Concepts and Properties
  - 1.1 Sets, Real Numbers, and Numerical Expressions
  - 1.2 Operations with real Numbers
  - 1.3 Properties of Real Numbers and the Use of Exponents
  - 1.4 Algebraic Expressions
  
2. Equations and Inequalities
  - 2.1 Solving First-Degree Equations
  - 2.2 Equations Involving Fractional Forms
  - 2.3 Equations Involving Decimals
  - 2.4 Formulas
  - 2.5 Inequalities
  - 2.6 More on Inequalities
  - 2.7 Equations and Inequalities Involving Absolute Value
  
3. Linear Equations and Inequalities in Two Variables
  - 3.1 Rectangular Coordinate System
  - 3.2 Linear Equations in Two Variables
  - 3.3 Linear Inequalities in Two Variables
  - 3.4 Distance and Slope
  - 3.5 Determining the Equations of a Line
  
4. Polynomials
  - 4.1 Polynomials: Sums and Differences
  - 4.2 Products and Quotients of Monomials
  - 4.3 Multiplying Polynomials

- 4.4 Factoring: Use of the Distributive Property
- 4.5 Factoring: Difference of Two Squares and Sum of Difference of Two Cubes
- 4.6 Factoring Trinomials
- 4.7 Equations and Problem -Solving
  
- 5. Rational Expressions
  - 5.1 Simplifying Rational Expressions
  - 5.2 Multiplying and Dividing Rational Expressions
  - 5.3 Adding and Subtracting Rational Expressions
  - 5.4 More on Rational Expressions and Complex Fractions
  - 5.5 Dividing Polynomials
  - 5.6 Fractional Equations
  - 5.7 More Fractional Equations and Applications
  
- 6. Exponents and Radicals
  - 6.1 Using Integers and Exponents
  - 6.2 Roots and Radicals
  - 6.3 Combining Radicals and Simplifying Radicals that Contain Variables
  - 6.4 Products and Quotients Involving Radicals
  - 6.5 Equations Involving Radicals
  - 6.6 Merging Exponents and Roots
  - 6.7 Scientific Notation
  
- 7. Quadratic Equations and Inequalities
  - 7.1 Complex Numbers
  - 7.2 Quadratic Equations
  - 7.3 Completing the Square
  - 7.4 Quadratic Formula
  - 7.5 More Quadratic Equations and Applications
  - 7.6 Quadratic Inequalities
  
- 10. Systems of Equations
  - 10.1 Systems of Two Linear Equations in two Variables
  - 10.2 Elimination-by-addition Method
  - 10.3 Systems of Three Linear Equations in Three Variables

### Course Objective

This course is designed to bridge the gap between elementary algebra and the more advanced courses in precalculus mathematics. After completion of Math 051, the student should be able to:

- Operate with sets, real numbers, and numerical expressions
- Understand and use exponents and radicals
- Simplify and evaluate algebraic expressions
- Solve linear and quadratic equations and inequalities involving absolute value
- Use and alter the form of formulas
- Solve first degree equations and inequalities involving absolute value
- Perform operations with polynomials, including factoring
- Use linear and quadratic equations
- Operate with rational expressions
- Solve rational equations
- Solve equations involving radicals
- Understand and operate with complex numbers
- Graph linear equations and linear inequalities in two variables
- Find the distance between two points
- Find the slope of a line
- Find the equation of a line
- Solve a system of two equations in two variables
- Solve a system of three equations in three variables