

INTERMEDIATE ALGEBRA MATH 112

1. Catalogue Description

This course contains many topics usually taught in a second-year algebra course including functions and relations. It is an advanced review of algebra designed for students who desire sufficient knowledge for Pre-Calculus and Calculus. It is a useful aid for increasing one's ability to solve problems in business, nursing, education, and science.

Prerequisite: MATH 098 or Equivalent.

(3 credits)

2. Goals

- a. Students will briefly review the fundamental concepts of numerical evaluation and estimation, as well as introductory or elementary algebra.
- b. Students will become familiar with polynomials, rational expressions, rational exponents and roots.
- c. Students will explore applications of algebra concepts to word problems in business, science and engineering.
- d. Students will acquire the ability to read, write, and communicate mathematically.
- e. Students will analyze other topics such as quadratic equations and inequalities, conic sections, and logarithms as a base for pre-calculus.

3. Instructional Procedures

- a. Lecture/Discussion
- b. Readings and assigned problems

4. Course Content

I. Introduction

- a. Review - Solving Equations and Inequalities containing Absolute Value

II. Basic Properties, Definitions and Procedures

- a. Linear Equalities and Inequalities in Two Variables
 1. Graphing: Slope and Straight Line
 2. Relations and Functions

- 3. Graphing Inequalities
- 4. Variations
- b. Factoring Trinomials
 - 1. Grouping
 - 2. Greatest Common Factor
- c. Addition, Subtraction, Multiplication and Division of Polynomials
- d. Equations and Factoring

III. Rational Expressions and Equations

- a. Four Operations and Rationals
- b. Rational Equations
- c. Word Problems
- d. Summary and Review

IV. Rational Exponents and Roots

- a. Review Exponents (Integral)
- b. Radicals and Rational Exponents
- c. Operations with Radicals
- d. Simplifying Radicals and Equations with Radicals
- e. Complex Numbers

V. Quadratic Equations and Inequalities

- a. Completing the Square
- b. Formula and Quadratic Equations
- c. Quadratic Inequalities
- d. Quadratic Functions (Graphs)

VI. Systems of Linear Equations

- a. Two and Three Variables
- b. Determinants
- c. Cramer's Rule
- d. Graphing Equations
- e. Word Problems

VII. Exponential and Logarithmic Functions

- a. Properties of Logarithms
- b. Common Logarithms
- c. Exponential and Logarithmic Equations
- d. Inverse Functions - optional

5. Evaluation Methods

- a. Mid-term and final examination (50%-75%)
- b. Periodic quizzes (15%-25%)
- c. Writing assignment (10%-25%)

6. Bibliography

a. Required Text

Tobey, John and Slater, Jeffrey, Intermediate Algebra, 2nd Ed., Prentice Hall, Englewood Cliffs, N.J., 1995.

Steffenson, Arnold R. and Johnson, L. Murphy, Intermediate Algebra, Scott, Foresman & Co., Glenview, Illinois, 1987.

b. Supporting Bibliography

Applications in School Mathematics, National Council of Teachers of Mathematics, 41st yearbook, 1979.

Problem Solving in Mathematics, National Council of Teachers of Mathematics, 42nd yearbook, 1980.

Teaching Secondary Mathematics, National Council of Teachers of Mathematics, 33rd yearbook, 1971.

c. Software

Kaufmann, Jerome E., IBM Edition User Notes, PWS-Kent - Test III for use with Elementary Algebra for College Students.

Poole, Barbara, Intermediate Algebra Demo Software to accompany text.

Interactive Algebra and Intermediate Algebra Tutor. Sample Test Generator.

Tront, Josph, Eureka, John Wiley & Sons. Graphing, Equation Solving, Simultaneous Equations, Trigonometric Functions, Derivative, Second Derivatives, Integrals, Simultaneous Inequalities, Circuits.