

Math1513 College Algebra – Objectives

Upon successful completion of this course a student will be able to:-

Solve linear equation in one variable

Determine the domain of a linear equation

Solve a linear equation given a real world word problem

Solve applications of linear equations including mixture; distance, rate, time; and quantity, rate, time.

Understand inequality and interval notation

Determine the union and intersection of sets, including notation

Solve single and double linear inequalities

Define the absolute value of a number

Solve absolute equations and inequalities giving graphical solutions as well as interval notation answers

Add, subtract, multiply and divide complex numbers

Solve equations with complex number solution, limited to linear and quadratic equations

Solve quadratic equations by

- Factoring

- Square root method

- Completing the square

- Using the quadratic formula

Use a 2 dimensional Cartesian coordinate system to

- Identify points in a plane

- Find the distance between points in space

- Find the mid-point between points in space

- Find the equation of a line connecting points in space

- Express the equation of a line in space

 - Using slope intercept format

 - Using point slope format

 - Convert either format to standard form and vice versa

Define a function versus a relation

Graph a function (max 2nd order, including piece wise definition) including the use of symmetry

Transform functions laterally and vertically including leading coefficient changes and reflection

Graph quadratic functions, identifying max/min, axis of symmetry and vertex.

Identify odd and even (or neither) functions

Solve quadratic inequalities

Add, subtract, multiply and divide functions, also combine functions using composition

Identify functions using vertical and horizontal line tests

Find the inverse of a function, if one exists

Prove the inverse property using composition and/or graphing

Determine properties of higher order functions, define left/right behavior of those functions

Divide polynomials, by long division and synthetic division

Determine possible rational zeros of polynomials

Determine zeros of polynomials using synthetic division whether real or complex (where possible)

Sketch graphs of rational functions using asymptotes, zeros and intercepts

Solve rational inequalities

Identify exponential functions

Solve exponential equations and modelling functions

Identify logarithmic functions; change from log to exponential form and vice versa

Explain the difference between common and natural logs
Evaluate logs to any base
Solve exponential and log equations (sound, earthquake, interest etc.)
Solve systems of linear equations using substitution and elimination
Solve systems of linear equations in 2 or more variables using
 Elimination or substitution
 Gauss-Jordan elimination
 Matrix methods (using the inverse)
 Cramer's rule
Evaluate determinants using
 Cofactor method
 Row/column reduction
Determine the inverse of a matrix (if it exists)
Add, subtract and multiply matrices (when possible)
Graph linear inequalities, determine corner points if appropriate
Identify solutions to linear inequalities, determine if the solution is bounded
Solve systems of non-linear equations