

Course: College Algebra Refresher

Course Description:

This course is basically to study algebraic concepts including linear and quadratic equations, inequalities, system of equations, polynomials, graphs of lines, concept of functions and their graphs, rational, exponential and logarithmic functions. Also here we will give an introduction to summation notation, sequences, and series.

Topics Covered:

- Radicals, integer and rational exponents
 - ✓ Simplify exponential and radical expressions and solve equations containing such expressions.
- Operations on complex numbers.
- Linear and quadratic equations and inequalities
 - ✓ Solve linear, quadratic and polynomial equations and inequalities in both real number and complex number domains.
- The Cartesian Plane and graphs
 - ✓ Find and graph equations of lines in both point-slope and slope-intercept form.
 - ✓ Find equations for circles and graph circles in the Cartesian Plane.
- Functions and their graphs
 - ✓ Determine if a relation is a function.
 - ✓ Identify the domain and range of polynomial, radical, rational, exponential, logarithmic and piecewise-defined functions, and evaluate their values.
 - ✓ Graph polynomial, radical, rational, exponential, logarithmic and piecewise defined functions.
 - ✓ Use the graph of a function to identify characteristics of the function such as specific values and symmetry.
 - ✓ Recognize graphs of common functions and graph transformations of these common functions.
 - ✓ Combine functions arithmetically and through composition and identify the domain of the resulting functions.
 - ✓ Describe and explain the fundamental concepts associated with inverse functions including the definition of one-to-one functions and the graphical interpretation of inverses.
- Polynomial and rational functions and graphs
 - ✓ Identify characteristics of the graphs of polynomial functions including end behavior and degree.
 - ✓ Apply the Fundamental Theorem of Algebra and related results to obtain a complete factorization of a polynomial function.
 - ✓ Identify vertical, horizontal and slant asymptotes of rational functions.
- Exponential and logarithmic functions and graphs

- ✓ Simplify exponential and logarithmic expressions and solve exponential and logarithmic equations.
- Systems of equations
 - ✓ Solve systems of linear equations in two and three variables and nonlinear systems in two variables.
- Sequences and series
 - ✓ Find terms of sequences and identify arithmetic and geometric sequences.
 - ✓ Use summation notation and compute the sum of sequences including arithmetic and geometric sequences.
- Solve real-world problems using a variety of linear, polynomial, rational, exponential and logarithmic models.

Duration: 20 days