

0003: BEGINNING & INTERMEDIATE ALGEBRA

COURSE OBJECTIVES

Upon successful completion of this course, you will

- Develop a deeper understanding of the real number system.
- Compare, simplify, and solve algebraic expressions, equations, and inequalities.
- Use multiple representations to develop and analyze linear functions.
- Use multiple representations to develop and analyze quadratic functions.
- Apply knowledge of rational numbers to rational expressions.
- Use measures of central tendency to analyze and compare real world data.

LESSON OBJECTIVES

REAL NUMBER SYSTEM

Students will develop a deeper understanding of the real number system.

Upon successful completion of this unit, you will be able to

- analyze and construct venn diagrams.
- organize sets of numbers using a venn diagram.
- compare sets of numbers using inequalities and ordering.
- use the real number line to identify and order real numbers.
- define absolute value in reference to the real number line.
- perform operations on real numbers.
- apply the order of operations to real numbers.
- apply exponent laws to real numbers.
- perform operations on real numbers involving radicals.
- simplify sums and differences of real numbers involving radicals.
- rationalize real numbers.

EXPRESSIONS, EQUATIONS, AND INEQUALITIES

Students will compare, simplify, and solve algebraic expressions, equations, and inequalities.

Upon successful completion of this unit, you will be able to

- compare and contrast expressions, equations, and inequalities.
- interpret verbal expressions as algebraic expressions.
- compare simplifying and evaluating algebraic expressions.
- evaluate algebraic expressions.
- simplify simple and complex algebraic expressions.
- use properties to solve one variable equations and inequalities.
- solve application problems using substitution.
- solve inequalities by applying properties.
- recognize and solve compound inequalities.
- extend and apply knowledge of absolute value to inequalities.
- recognize, use, and compare interval notation and inequality notation.

LINEAR FUNCTIONS

Students will use multiple representations to develop and analyze linear functions.

Upon successful completion of this unit, you will be able to

- define and describe relations and functions
- understand and apply correct, mathematical, function notation
- differentiate between relations and functions using: notation (equations)
- differentiate between relations and functions using: verbal descriptions
- differentiate between relations and functions using: ordered pairs / tables
- differentiate between relations and functions using: graphs
- derive the formula for slope using the Pythagorean Theorem
- apply the slope formula to calculate slope given two points. (ordered pairs / from a graph)
- use (the formula for) slope, along with a single given point, to find the equation of a given line
- convert between point slope form and slope intercept form
- analyze point slope form and standard form in order to determine their usefulness

QUADRATIC FUNCTIONS

Students will use multiple representations to develop and analyze quadratic functions.

Upon successful completion of this unit, you will be able to

- compare multiple representations for a single quadratic function (verbal, equation, table, graph)
- devise examples for situations in which each representation would best be used to convey information
- create graphical representations of quadratic functions by hand
- label the x-intercepts (zeros, roots, solutions) of graphed quadratic functions
- demonstrate their ability to find *the* greatest common factor for polynomials
- demonstrate their ability to factor the special case “difference of squares”
- compare the factors of a “difference of squares” case and compare it with the quadratic graph
- demonstrate their ability to factor trinomials with leading coefficient 1
- demonstrate their ability to factor trinomials with leading coefficient $\neq 1$
- use technology to analyze the trinomial factors, and the ‘x-intercepts’ for a given function
- apply the quadratic formula to solve quadratic functions
- demonstrate their ability to ‘solve’ quadratics by: factoring, graphing, and use of the quadratic formula
- propose definitions for what it means to “solve” a quadratic function

RATIONAL EXPRESSIONS

Students will apply knowledge of rational numbers to rational expressions.

Upon successful completion of this unit, you will be able to

- multiply and divide rational expressions.
- add and subtract rational expressions.
- solve applications problems involving proportional reasoning.

DATA ANALYSIS

Students will use measures of central tendency to analyze and compare real world data.

Upon successful completion of this unit, you will be able to

- compare and apply measures of central tendency to a set of data.
- recognize and correct misleading statistics.
- analyze real world data using measures of central tendency.