Intermediate Topics in Algebra/Geometry
Essential Curriculum

UNIT I: Solving Linear Equations

Goal. The student will demonstrate the ability to solve linear equations and apply these concepts to real world problems

Objectives – The student will be able to:
a. Solve single and multi-step equations.
b. Use the distributive property to solve equations.
c. Solve equations using real numbers other than integers.
d. Solve equations involving geometric properties.
e. Solve literal equations.

UNIT II: Linear Functions and Graphs

Goal. The student will demonstrate the ability to graph and write linear equations and apply these concepts to solve real-world problems.

Objectives – The student will be able to:
a. Plot points on the Cartesian plane.
b. Identify and calculate the slope of a line.
c. Graph linear equations using a variety of methods.
d. Determine the equation of a line.
e. Rewrite an equation in standard form to slope-intercept form and vice versa.
f. Use slope to identify parallel and perpendicular lines and to write equations of lines that are parallel and perpendicular to given lines.
g. Adjust the graphing calculator window to view real-world applications of graphs of linear functions.

UNIT III: Linear Systems

    Goal. The student will demonstrate the ability to develop systems of linear equations to model real-world situations. Systems of linear equations will be solved using a variety of methods and the solutions will be interpreted in the context of the problem.

    Objectives – The student will be able to:
    a. Develop a system of linear equations given a written or graphical description.
    b. Solve a system of linear equations by graphing.
    c. Differentiate among the types of linear systems: parallel, intersecting, and conincident lines.
    d. Solve a system of linear equations by substitution.
    e. Solve a system of linear equations by linear combination.
    f. Solve a system of linear equations using the graphing calculator.
    g. Interpret the graph and the solution of a system of linear equations.
    h. Graph the solutions to a system of linear inequalities.
    i. Solve real-world problems using systems of equations.

UNIT IV: Simplifying Radicals

    Goal. The student will demonstrate the ability to simplify radicals and perform operations on radical expressions and apply these concepts to real-world applications.

    Objectives – The student will be able to:
    a. Define and recognize radical functions.
    b. Evaluate and simplify radical functions.
    c. Add, subtract, multiply, and divide radical expressions
    d. Use the Pythagorean Theorem to solve real-world problems involving radicals.

UNIT V: Operations with Polynomial Expressions

    Goal. The student will demonstrate the ability to perform operations with polynomial expressions.

    Objectives – The student will be able to:
    a. Determine the degree of a polynomial and express it in standard form.
    b. Simplify polynomials using addition and subtraction.
    c. Multiply a monomial and polynomial.
    d. Multiply two binomials.
    e. Identify the greatest common factor of the terms of a polynomial expression.
    f. Express a polynomial as a product of binomials, include difference of squares, perfect trinomials, and trinomials where $a = 1$ and $a \neq 1$.