

Department: Mathematics

Course Name: Algebraic and Geometric Theory

Course Description:

Algebraic and Geometric Theory is a continuum of Pre-Algebra with an emphasis on US Algebra preparation. Concepts are introduced with emphasis on algebraic theory followed by practical application. All operations with real numbers and variables are fine-tuned. Solving equations is interwoven throughout the course to include equation-based problem solving. Throughout the course of the year, students will master concepts in Geometry, Measurement, Data Analysis, Number and Operations, and Algebra.

Content:

Principles of Algebra

Rational Numbers

Graphs and Relationships

Properties of Exponents and Roots

Foundations in Geometry

Perimeter, Area and Application

Data and Statistics

Probability

Multi-Step Equations and Inequalities

Linear Equations

Skills:

Evaluate algebraic expressions

Translate between algebraic and word phrases

Apply properties of numbers

Perform integer operations

Solve one-step equations using addition, subtraction, multiplication and division

Solve and graph inequalities

Write rational numbers in equivalent forms

Compare and order positive and negative rational numbers written as fractions, decimals and integers

Perform operations with rational numbers

Solve equations with rational numbers

Solve two-step equations

Write solutions of equations in two variables as ordered pairs

Graph points on the coordinate plane

Interpret information given in a graph and make a graph to model a situation

Represent functions with tables, graphs or equations

Generate different representations of the same data

Evaluate expressions with exponents

Evaluate expressions with negative exponents and evaluate the zero exponent

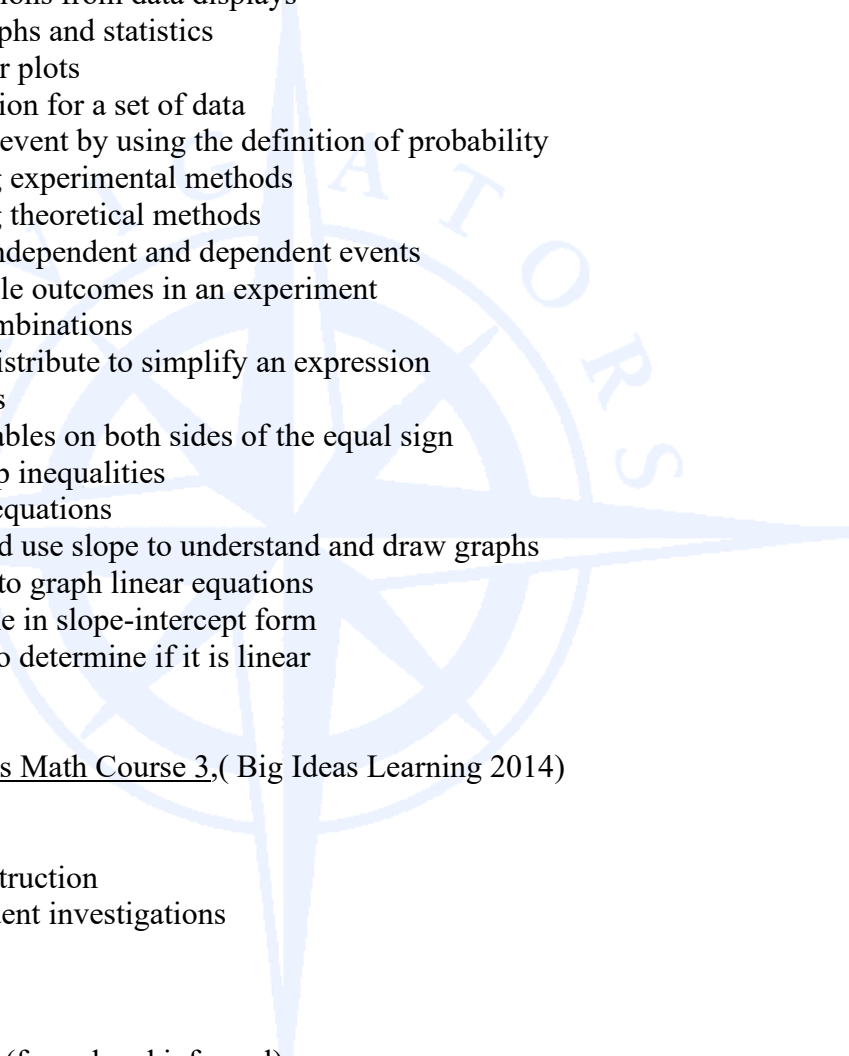
Apply the properties of exponents

Express large and small numbers in scientific notation and compare two numbers written in scientific notation

Find square roots

Estimate square roots to a given number of decimal places and solve problems using square roots

Make comparisons between and find dimensions of scale drawings, models and actual objects



Become familiar with the concept of scale by making a scale drawing
Find the perimeter and area of rectangles and parallelograms
Find the perimeter and area of triangles and trapezoids
Find the surface area and volume of prisms, pyramids and cylinders
Verify the properties of transformations
Describe transformations using coordinates
Apply the Pythagorean Theorem
Organize data in line plots, stem-and-leaf plots
Find appropriate measures of central tendency
Display data in bar graphs, histograms and line graphs
Analyze and make predictions from data displays
Recognize misleading graphs and statistics
Create and interpret scatter plots
Select the best representation for a set of data
Find the probability of an event by using the definition of probability
Estimate probability using experimental methods
Estimate probability using theoretical methods
Find the probabilities of independent and dependent events
Find the number of possible outcomes in an experiment
Find permutations and combinations
Combine like terms and distribute to simplify an expression
Solve multi-step equations
Solve equations with variables on both sides of the equal sign
Solve and graph multi-step inequalities
Identify and graph linear equations
Find the slope of a line and use slope to understand and draw graphs
Use slopes and intercepts to graph linear equations
Write the equation of a line in slope-intercept form
Collect and analyze data to determine if it is linear

Text and Materials:

Boswell, Larson, Big Ideas Math Course 3, (Big Ideas Learning 2014)

Methods of Instruction:

Large and small group instruction
Small group and independent investigations
Online Activities

Methods of Evaluation:

Summative and formative (formal and informal)
Observation