

Saddlebrook Preparatory School
Mathematics Curriculum – Pre-Algebra

Saddlebrook Course Number: 68
Florida DOE Course Number: 1200300
Course Title: Pre-Algebra I
Credit: 1.0

A. Major Concepts/Content

The purpose of this course is to develop the mathematical concepts and processes that can be used to solve a variety of real world and mathematical problems, with emphasis on strengthening the skills and concepts needed for success in Algebra I. The content should include, but not be limited to, the following:

- structure and properties of the real number system
- operations with integers and other rational numbers
- varied means for analyzing and expressing patterns, relations, and functions, including verbal and written descriptions, tables, rules, sequences, graphs, and algebraic equations
- coordinate geometry and graphing of linear equations and inequalities
- solution strategies for simple linear equations and inequalities of one variable
- algebraic and coordinate plane graphic solution strategies for linear functions and inequalities
- relationships expressed by ratio, rates, proportion, and percents
- descriptive statistics including measures of central tendency and plotting procedures
- probability of independent and dependent events
- algebraic applications in geometry including angle and similarity relationships, the Pythagorean Theorem, and formulas for measuring area and volume
- introduction to polynomials

Pre-Algebra shall integrate Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

B. Course Requirements

These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course as well as those standards established by the National Council of Teachers of Mathematics. The benchmarks printed in regular type are required for this course. **The portions printed in *italic type* are not required for this course.**

After successfully completing this course, the student will:

1. Demonstrate understanding of the different ways numbers are represented and used in the real world.

- MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, *and complex numbers*.
- MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.
- MA.A.1.4.3 understand concrete and symbolic representations of real *and complex* numbers in real-world situations.
- MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, *and logarithms*.

2. Demonstrate understanding of number systems

- MA.A.2.4.2 understand and use the real number system.

3. Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problem solving.

- MA.A.3.4.1 understand and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.
- MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.
- MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

3. Use estimation in problem solving and computation.

- MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

5. Demonstrate understanding and application of theories related to numbers.

- MA.A.5.4.1 apply special number relationships such as sequences *and series* to real-world problems.

6. Measure quantities in the real world and use the measures to solve problems.

- MA.B.1.4.1 use concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids, cylinders, cones, and pyramids.
- MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, *and arc lengths*.
- MA.B.1.4.3 relate the concepts of measurement to similarity and proportionality in real-world situations.

7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/ customary).

- MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).

8. Estimate measurements in real-world problem situations.

- MA.B.3.4.1 solve real-world and mathematical problems involving estimates of measurements, including length, time, weight/mass, temperature, money, perimeter, area, and volume and estimate the effects of measurement errors on calculations.

9. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.

- MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, *tangency*, congruency, similarity, *reflections*, *symmetry*, *and transformations including flips, slides, turns, enlargements, and rotations*.

10. Use coordinate geometry to locate objects in two-dimensions and to describe objects algebraically.

- MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, *and properties of right triangle trigonometry*.
- MA.C.3.4.2 using a rectangular coordinate system (graph), apply and algebraically verify properties of two- *and three*-dimensional figures, including *distance, midpoint, slope, parallelism, and perpendicularity*.

11. Describe, analyze, and generalize a wide variety of patterns, relations, and functions.

- MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
- MA.D.1.4.2 determine the impact when changing parameters of given functions.

12. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.

- MA.D.2.4.1 represent real-world problem situations using finite graphs, *matrices, sequences, series, and recursive relations*.
- MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, *algebraically, and with matrices*.

13. Demonstrate understanding and use the tools of data analysis for managing information.

- MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.
- MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range, *standard deviation, and variance*) for *complex* sets of data and determine the most meaningful measure to describe the data.
- MA.E.1.4.3 analyze real-world data and make predictions of larger populations by *applying formulas to calculate measures of central tendency and dispersion* using the sample population data and using appropriate technology, including calculators and computers.

14. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.

- MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams *and formulas for permutations and combinations*.
- MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.

15. Use statistical methods to make inferences and valid arguments about real-world situations.

- MA.E.3.4.2 explain the limitations of using statistical techniques and data in making inferences and valid arguments.