Syllabus for First-Year Algebra Course
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Unit 1: Review and Expand
- Number Systems (Whole, Integer, Rational, Real)
- Simplify/Evaluate Expressions (using Order of Operations)
- Writing/Solving Proportions
- Operations/Problems with Scientific Notation

Unit 2: Functions
- Linear "real world" examples
- Terminology (increase/decrease, discrete/continuous, dependent/independent)
- Graphing lines using slope/intercept
- Finding equations of lines
- Parallel and perpendicular lines and slope
- Solving literal equations (e.g., $2x + 3y = 10$ for x)

Unit 3: Linear Functions, Continued
- Line of best fit
- Correlation
- Solving Linear Equations
    - Using a graph
    - Using algebra tiles to "balance" sides
    - By hand

Unit 4: Function Notation and Quadratics
- Function Notation
- Solving equations with absolute value, square roots, and squares
- Quadratic Functions
    - Equations and terminology
    - Graphs
    - Families of curves

Unit 5: Other Functions
- Absolute Value Function
    - Finding absolute value
    - Graphing/Transforming "V" shapes
- Rational Functions and Graphs
- Piecewise Functions and Graphs
- Nonlinear Systems (e.g., use a graph to find the intersection of a linear-quadratic system)

Unit 6: Still More Functions
- Exponential Functions
    - Writing equations
    - *The Brahier family buys a new dishwasher for $625. Experts say appliances depreciate at an average rate of 12% per year. Approximately how much will the dishwasher be worth in 5 years?*
    - Drawing graphs
- Step Functions

Unit 7: Solving Systems of Linear Equations
- Graphing Method
- Substitution Method
- Elimination Method

- Use **all 3** methods
- Word Problems using systems

Unit 8: Manipulating and Using Polynomials
- "Traditional" Word Problems
  - "Find two numbers that …"
  - Consecutive Integers
  - Perimeter/Geometry Problems
- Polynomials – add/subtract/multiply/divide
- Multiplying Polynomials
  - Algebra Tiles
  - Using "charts"
  - Mentally – tested on this

Unit 9: All Things Quadratic
- Graphing (review)
- Factoring (Completely)
  - Factoring to identify zeros of the function
- Solving Quadratic Equations
  - Taking a square root
  - Factoring
  - Completing the Square
  - Quadratic Formula
    - Discriminant and what it tells us

Unit 10: Inequalities
- Graphing 1-D inequalities on a number line
- Solving a linear inequality and graphing it
- Union and Intersection of inequalities
- Graphing 2-D inequalities in the plane
- Systems of 2-D inequalities

Unit 11: Irrational Numbers
- Number Systems, revisited
- Radicals (add, subtract, multiply, rationalize)
- Test – also includes 16 End-Of-Course exam items

Unit 12: Data Analysis
- Distributions – symmetrical, asymmetrical
- Representing Data through Graphs
  - Dot Plots
  - Histograms
  - Scatterplots (revisited)
- Central Tendency
  - Mean, Median, Mode
- Five-Number Summaries
- Absolute and Standard Deviation

Unit 13: Right Triangles
- Terminology – postulate, theorem
- History – who were Pythagoras, Euclid, the Greeks, etc.?
- Pythagorean Theorem to solve problems
- Distance Formula (find distance using Pythagorean Theorem!)
- Right Triangle Trigonometry
  - Problems involving sine, cosine, tangent