

Wisconsin Lutheran High School 2007-2008

Course Title **Algebra 1A**

Instructor **Mr. Seeger**

Textbook *Algebra 1* – Larson, Boswell, Kanold, Stiff: McDougal; Littell, 2001

Student Supplies

- Notebooks (one per quarter or one multi section for the entire year)
- Calculator (TI 83+ Graphing Calculator)
- Pencils (#2)
- 3-ring binder with 12 tabbed dividers

Course Purpose

Algebra 1A is designed to provide the student with the foundation skill necessary for advancing through the math curriculum. It is also formatted to assist students in seeing mathematics as a part of God's logical order and expression in creation with an emphasis on the importance of mathematics as it relates to life roles. Students will develop competent problem solving skills and the ability to effectively communicate and justify solutions to a variety of problems.

Course Outcomes

1. The students will gain a better understanding of God's order in creation as it relates to the properties of algebra.
2. The students will have the opportunity to work cooperatively with others as team members
3. The students will solve various equations of one variable using the properties of real numbers.
4. The students will demonstrate the ability to factor basic expressions.
5. The students will demonstrate competency with exponents in variable expressions.
6. The students will graph linear and non-linear equations, choosing the best among a variety of techniques.
7. The students will analyze quadratic equations and solve them with a variety of different techniques.
8. The students will develop basic mathematical modeling skills.

9. The students will analyze data and present the results verbally, technologically, and in written form.
10. The students will demonstrate basic technology literacy in working with handheld technology.

Course Goals

1. Prepare each student to use his/her talents to glorify God in a life of faithful service.
2. Guide each student to faithfully use problem solving techniques to aid in solving real-life problems.

A variety of instructional techniques will be used. They will include, but are not limited to, lecture/presentation, small group work, individual work, class discussion, overhead projector / graphing calculator, and power point presentations.

Classroom Expectations

1. **Attendance:** It is very important to attend class every day. Although you will not lose points for absences, your grade will definitely be affected.
2. **Make Up Work:**
 - a. If you miss an assignment or test you will be expected to make it up.
 - b. If you miss notes you should see a classmate to get them.
 - c. Late work will not be tolerated more than one time a quarter. The second late assignment will be an automatic 0.
3. **Tardiness:** You must be in your seat with all of your supplies when the tone sounds. Penalties will follow according to school policy.
4. **Homework:**
 - a. All work must be done in your notebook
 - b. Work must be legible.
 - c. Any work turned in late will be graded accordingly.
5. **Quizzes and Tests:**
 - a. All chapter tests can be retaken once—better grade is taken.
 - b. All quizzes are final (NO RETAKES!)—notes and previous assignments can be used for all quizzes.
6. **Plagiarism:** You are responsible for your own work. Copying of any assignment, quiz, or test may result in a zero for all parties involved. It may also result in redoing an assignment, quiz, or test or failure of the course.
7. **Additional Information:**
 - a. Notebooks will be collected and graded at the end of each chapter.
 - b. All students are to record homework assignments in the Student Planner (supplied by WISCO).
 - c. Progress reports are available anytime by using the PASS system and they will be distributed on each Mid-Term Grading Day.

Grading Scale

Tests	50%	Semester Grade	
Quizzes	25%	Quarter	40%
Homework	20%	Quarter	40%
CT /ST/ CR	05%	Exam	20%
Notebook / Ring Binder (Recorded in Quizzes)			

Course Outline

Quarter 1—Chapters 1-3	Quarter 2—Chapters 4-6
Quarter 3—Chapters 7-9	Quarter 4—Chapters 10-12

Chapter One: Connections to Algebra

The students will . . .

- ✓ Write and evaluate variable expressions
- ✓ Check solutions to equations containing exponents
- ✓ Evaluate expressions using an order of operations
- ✓ Check solutions and solve equations and inequalities using mental math in real life problems
- ✓ Translate verbal and written phrases into algebraic models to represent real-life situations
- ✓ Organize data into tables and represent functions

Textbook: pages 3-59; Power Point – 1.5

S.O. – 2, 4, 6

D.O. – 1.1, 4.2, 5.3

Chapter Two: Properties of Real Numbers

The students will . . .

- ✓ Graph and compare real numbers while finding the opposite and absolute values of numbers in real-life applications
- ✓ Add and subtract real numbers to solve real-life problems
- ✓ Organize data and add and subtract data using matrices
- ✓ Multiply and divide real numbers to solve real-life problems
- ✓ Use the distributive property
- ✓ Will learn to find the probability and odds of an event

Textbook: pages 63-127; Power Point -2.6

S.O. – 2, 4, 6

D.O. – 4.2, 4.3

Chapter Three: Solving Linear Equations

The students will . . .

- ✓ Use a variety of techniques for solving linear equations systematically
- ✓ Apply problem solving strategies (including drawing diagrams, using estimation, and using tables and graphs) to solve linear equations
- ✓ Solve a variety of given formulas
- ✓ Rewrite equations in function form
- ✓ Use ratios and percents to solve real-life problems

Textbook: pages 132-197; Power Point – 3.3; Cumulative Assessment 1-3

S.O. – 2, 4, 6

D.O. – 2.1, 4.2, 4.3

Chapter Four: Graphing Linear Equations and Functions

The students will . . .

- ✓ Plot points in a coordinate plane
- ✓ Graph linear equations
- ✓ Find the y-intercept and the slope of a line
- ✓ Use two ways to graph linear equations quickly: intercept and slope-intercept form
- ✓ Write linear equations to represent direct variation
- ✓ Determine whether an equation or a graph represents a function

Textbook: pages 203-269; Power Point – 4.4

S.O. – 2, 4, 6

D.O. – 3.3, 4.2, 4.4

Chapter Five: Writing Linear Equations

The students will . . .

- ✓ Write linear equations using different forms: slope-intercept and standard
- ✓ Write a linear equation given a slope and a point, or given two points
- ✓ Fit a line to data and use linear interpolation or linear extrapolation
- ✓ Write and predict with linear models

Textbook: pages 273-329; Power Point 5.4

Number of days: 11-15

S.O. – 2, 4, 6

D.O. – 2.1, 4.2, 4.3

Chapter Six: Solving and Graphing Linear Inequalities

The students will . . .

- ✓ Solve and graph linear inequalities
- ✓ Solve and graph compound inequalities
- ✓ Solve and graph absolute value equations and inequalities
- ✓ Graph linear inequalities with two variables
- ✓ Use stem and leaf plot to put data in order
- ✓ Draw box-and-whisker plots to organize real life data

Textbook: pages 334-389; Power Point 6.4; Cumulative Assessment 1-6

S.O. – 2, 4, 6

D.O. – 2.1, 3.3, 4.2

Chapter Seven: Systems of Linear Equations and Inequalities

The students will . . .

- ✓ Solve a system of linear equations using three methods: graphing, substitution, and linear combination
- ✓ Determine the number of solutions of a linear system
- ✓ Graph and solve a system of linear inequalities

Textbook: pages 398-445; Power Point 7.5

S.O. – 2, 4, 6

D.O. – 2.1, 3.3, 4.2

Chapter Eight: Exponents and Exponential Functions

The students will . . .

- ✓ Multiply and divide expressions with exponents
- ✓ Evaluate powers that have zero and negative exponents
- ✓ Use scientific notation in problem solving
- ✓ Use exponential growth and decay models to solve real-life problems

Textbook: pages 450-499; Power Point – 8.5 & 8.6

S.O. – 2, 4, 6

D.O. – 1.2, 3.1, 4.2

Chapter Nine: Quadratic Equations and Functions

The students will . . .

- ✓ Evaluate and approximate square roots
- ✓ Simplify radicals
- ✓ Solve a quadratic equation by graph and quadratic formula
- ✓ Use the discriminant to find the number of solutions of a quadratic equation
- ✓ Compare linear, exponential, and quadratic models
- ✓ Choose a model that best fits a collection of data

Textbook: pages 503-569; Power Point – 9.4; Cumulative Assessment 1-9

Number of days: 9-12

S.O. – 2, 4, 6

D.O. – 2.1, 2.3, 4.2

Chapter Ten: Polynomials and Factoring

The students will . . .

- ✓ Add, subtract, and multiply polynomials
- ✓ Use special product patterns of the product of a sum and a difference and for the square of a binomial
- ✓ Factor polynomials
- ✓ Solve polynomial equations in factored form by factoring
- ✓ Use the distributive property to factor polynomials and solve equations by factoring

Textbook: pages 576-639; Power Point -10.6

Number of days: 13-17

S.O. – 2, 4, 6

D.O. – 2.1, 2.3, 4.2

Chapter Eleven: Rational Equations and Functions

The students will . . .

- ✓ Solve rational equations
- ✓ Add, subtract, multiply, and divide rational expressions
- ✓ Graph rational functions, including inverse variation functions
- ✓ Solve problems using ratio, proportion, and percents

Textbook: pages 643-705; Power Point – 11.3

Number of days: 12-16

S.O. – 2, 4, 6

D.O. – 2.1, 3.1, 4.2

Chapter Twelve: Radicals

The students will . . .

- ✓ Graph functions involving square roots
- ✓ Add, subtract, multiply, and divide radical expressions
- ✓ Simplify radical expressions using a variety of operations
- ✓ Solve radical equations and graph radical functions
- ✓ Use Pythagorean theorem, distance and midpoint formulas
- ✓ Use sine, cosine, and tangent of an angle in real life problems

Textbook: pages 709-728; Power Point – 12.4; Cumulative Review 1-12

S.O. – 2, 4, 6

D.O. – 4.2, 4.3, 5.3

Wisconsin Model Academic Standards Met Throughout the Course:

A.12.1 Use reason and logic to

- evaluate information
- perceive patterns
- identify relationships
- formulate questions, pose problems, and make and test conjectures
- pursue ideas that lead to further understanding and deeper insight

A.12.2 Communicate logical arguments and clearly show

- why a result does or does not make sense
- why the reasoning is or is not valid
- an understanding of the difference between examples that support a conjecture and a proof of the conjecture

A.12.3 Analyze non-routine* problems and arrive at solutions by various means, including models* and simulations, often starting with provisional conjectures and progressing, directly or indirectly, to a solution, justification, or counter-example

A.12.4 Develop effective oral and written presentations employing correct mathematical terminology, notation, symbols, and conventions for mathematical arguments and display of data

A.12.5 Organize work and present mathematical procedures and results clearly, systematically, succinctly, and correctly

B.12.2 Compare real numbers using

- order relations ($>$, $<$) and transitivity*
- ordinal scales including logarithmic (e.g., Richter, pH rating)
- arithmetic differences
- ratios, proportions, percents, rates of change

B.12.3 Perform and explain operations on real numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value)

B.12.4 In problem-solving situations involving the application of different number systems (natural, integers, rational*, real*) select and use appropriate

- computational procedures
- properties (e.g., commutativity*, associativity*, inverses*)
- modes of representation (e.g., rationals as repeating decimals, indicated roots as fractional exponents)

C.12.4 Use the two-dimensional rectangular coordinate system* and algebraic procedures to describe and characterize geometric properties and relationships such as slope*, intercepts*, parallelism, and perpendicularity

D.12.3 Determine measurements indirectly*, using

- estimation
- proportional reasoning, including those involving squaring and cubing (e.g., reasoning that areas of circles are proportional to the squares of their radii)
- techniques of algebra, geometry, and right triangle trigonometry
- formulas in applications (e.g., for compound interest, distance formula)
- geometric formulas to derive lengths, areas, or volumes of shapes and objects (e.g., cones, parallelograms, cylinders, pyramids)
- geometric relationships and properties of circles and polygons (e.g., size of central angles, area of a sector of a circle)
- conversion constants to relate measures in one system to another (e.g., meters to feet, dollars to Deutschmarks)

F.12.1 Analyze and generalize patterns of change (e.g., direct and inverse variation) and numerical sequences, and then represent them with algebraic expressions and equations

F.12.2 Use mathematical functions* (e.g., linear*, exponential*, quadratic*, power) in a variety of ways, including

- recognizing that a variety of mathematical and real-world phenomena can be modeled* by the same type of function
- translating different forms of representing them (e.g., tables, graphs, functional notation*, formulas)
- describing the relationships among variable quantities in a problem
- using appropriate technology to interpret properties of their graphical representations (e.g., intercepts, slopes, rates of change, changes in rates of change, maximum*, minimum*)

F.12.3 Solve linear and quadratic equations, linear inequalities, and systems of linear equations and inequalities

- numerically
- graphically, including use of appropriate technology
- symbolically, including use of the quadratic formula