

Wisconsin Lutheran High School



Course Title Algebra 1 2007-2008

Instructor Mr. Blair Schaper

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

Student Supplies Required

- Notebooks (one per quarter or one multi section for the entire year)
- Calculator (TI 83+ Graphing Calculator or TI 84 Silver Edition)
- Pencils (#2) Several and The Student Planner supplied by Wisconsin Lutheran
- 1" Binder and loose leaf paper / Divider Tabs Optional

Course Purpose

Algebra 1 is designed to provide the student with the foundational skill necessary for advancing through the math curriculum. It is also formatted to assist students in viewing 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 according to the properties of algebra.
2. The students will have the opportunity to work cooperatively with others as members of a team.
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 the proper technique.
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 as our school theme "**My Faith, My Ministry**" teaches.
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, Smartboard / graphing calculator, and power point presentations.

Classroom Expectations

1. **Attendance:** It is very important to attend class each school day. Although you will not lose points for absences, your knowledge base and possible grade will be affected.
2. **Make Up Work:**
 - a. If you miss an assignment or test you will be expected to finish the work.
 - b. If you miss notes you should see a classmate to get needed class notes.
 - c. Late work will not be tolerated. Work turned in one day late will receive a maximum of 50% for that assignment. Two or more days is an additional 10% lost each day. It is in your best interest to get work in on time.
3. **Tardies:** You must be in your seat with all of your supplies when the tone sounds. We will follow procedures according to school policy.
4. **Homework:**
 - a. All work must be done in your notebook AND in pencil.
 - 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—the average grade is taken.
 - b. All quizzes are final (**NO RETAKES!**)—notes and previous assignments can be used for all quizzes. It is the student's advantage to maintain proper notes.
6. **Plagiarism:** You are responsible for your own work. Copying of any assignment, quiz, or test will result in a zero for all parties involved. It may also result in redoing an assignment, quiz, or test or failure of the course. See handbook.
7. **Additional Information:**
 - a. Notebooks will be collected and graded at least four times throughout the year. Please check the percentage value of notebook work, this is important.
 - b. All students are to record homework assignments in the Student Planner (supplied by WISCO).
 - c. Progress reports will be given to all students during each month—in addition to a progress report at each mid-term and quarters.

Grading Scale

Tests	40%
Quizzes	25%
Homework	20%
Participation	10%
Notebook/Binder	05%

Semester Grade

Quarter	40%
Quarter	40%
Exam	20%

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

W.S.S. – A. 12.1, 5 / B. 12.3 / F. 12.2

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

W.S.S. – A. 12.5 / B. 12.2, 4 / D. 12.3

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

W.S.S. – A. 12.1, 2,3,5 / F. 12.3

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

W.S.S. – A. 12.5 / B. 12.2,4 / D. 12.3

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

W.S.S. – A.12.1, 5 / C. 12.4 / F. 12.2, 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

W.S.S. – A.12.5 / B.12.2, 3 / C. 12.4 / F. 12.2,3

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

W.S.S. – A.12.5 / B. 12.2 / F. 12.2,3

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

W.S.S. – A. 12.5 / B. 12.3 / F. 12.2

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

W.S.S. – A. 12.5 / F. 12.2,3

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

W.S.S. – A. 12.5 / B. 12.3

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

W.S.S. – A. 12.5 / B. 12.2, 3,4 / F. 12.1, 3

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

W.S.S. – A. 12.5 / B. 12.3

APPENDIX

Algebra 1

Mr. Blair Schaper

Math Department Outcomes

Chapter One: Connections to Algebra

1. A God-centered thinker who:
 - 1.1 Distinguishes the proper place and role of mathematics in his/her mission to serve God. **“My Faith, My Ministry”!**
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.
5. A self-directed learner who:
 - 5.3 Is prepared for the next higher level of mathematics in their educational and life endeavors.

Chapter Two: Properties of Real Numbers

4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.
4. An effective communicator who:
 - 4.3 Effectively expresses mathematical ideas in written form.

Chapter Three: Solving Linear Equations

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.
4. An effective communicator who:
 - 4.3 Effectively expresses mathematical ideas in written form.

Chapter Four: Graphing Linear Equations and Functions

3. A decision maker who:
 - 3.3 Is capable of effectively using technology as a tool for problem solving.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

4. An effective communicator who:
 - 4.4 Demonstrates the use of various technologies in expressing mathematical ideas and competencies.

Chapter Five: Writing Linear Equations

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.
4. An effective communicator who:
 - 4.3 Effectively expresses mathematical ideas in written form.

Chapter Six: Solving and Graphing Linear Inequalities

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
3. A decision maker who:
 - 3.3 Is capable of effectively using technology as a tool for problem solving.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

Chapter Seven: Systems of Linear Equations and Inequalities

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
3. A decision maker who:
 - 3.3 Is capable of effectively using technology as a tool for problem solving.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

Chapter Eight: Exponents and Exponential Functions

1. A God-centered thinker who:
 - 1.2 Recognizes God's logical order and expression in creation as evidenced in the structure of mathematics. **"My Faith, My Ministry"!**
3. A decision maker who:
 - 3.1 Integrates the use of mathematics into other academic and real-life areas.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

Chapter Nine: Quadratic Equations and Functions

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
2. An innovative problem solver who:
 - 2.3 Is a logical thinker and uses the principles of logic to:
 - 2.3.1 deduce tentative conclusions to real-life problems
 - 2.3.2 justify the validity of conclusions
 - 2.3.3 derive valid solutions
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

Chapter Ten: Polynomials and Factoring

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
2. An innovative problem solver who:
 - 2.3 Is a logical thinker and uses the principles of logic to:
 - 2.3.1 deduce tentative conclusions to real-life problems
 - 2.3.2 justify the validity of conclusions
 - 2.3.3 derive valid solutions
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

Chapter Eleven: Rational Equations and Functions

2. An innovative problem solver who uses God-given gifts and:
 - 2.1 Develops a repertoire of problem solving techniques.
3. A decision maker who:
 - 3.1 Integrates the use of mathematics into other academic and real-life areas.
4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.

Chapter Twelve: Radicals

4. An effective communicator who:
 - 4.2 Documents a logical sequence of symbolic manipulation.
4. An effective communicator who:
 - 4.3 Effectively expresses mathematical ideas in written form.
5. A self-directed learner who:
 - 5.3 Is prepared for the next higher level of mathematics in their educational and life endeavors.

School Outcomes:

The courses and programs of Wisconsin Lutheran High School will carry out the mission by producing graduates who have demonstrated:

- 1) Regular use of the means of grace and fruits of their faith in Jesus Christ through Christian love, service, and witness.
- 2) Perceptive thinking which integrates experience, research, and reason under God's will as revealed in His Holy Word in critical analysis, problem solving, and decision making. **My Faith, My Ministry!**
- 3) Effective communication skills by listening; expressing their thoughts, feelings, faith, and ideas; and working cooperatively with others in family, school, church, work, and community settings.
- 4) The knowledge, skills, and attitudes necessary to become self-initiating and self-directing lifelong learners.
- 5) The conviction that they are individually formed creatures of their Maker and Redeemer who represent Him by using their unique blessings of time, gifts, and money for the welfare of others in a complex, culturally diverse, rapidly changing global society.

- 6) The verbal, sociological, scientific, quantitative, and technological literacy necessary for offering God a productive, meaningful life.
- 7) An informed awareness of the uses of the fine and practical arts for personal and corporate worship, individual expression, and God-pleasing recreation.

Wisconsin State Standards

Chapter One: Connections to Algebra

W.S.S.: 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

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

W.S.S.: 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)

W.S.S.: 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*)

Chapter Two: Properties of Real Numbers

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

W.S.S.: 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

W.S.S.: 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)

W.S.S.: 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)

Chapter Three: Solving Linear Equations

W.S.S.: 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

W.S.S.: 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

W.S.S.: 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

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

W.S.S.: 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

Chapter Four: Graphing Linear Equations and Functions

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

W.S.S.: 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

W.S.S.: 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)

W.S.S.: 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)

Chapter Five: Writing Linear Equations

W.S.S.: 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

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

W.S.S.: 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

W.S.S.: 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*)

W.S.S.: 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

Chapter Six: Solving and Graphing Linear Inequalities

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

W.S.S.: 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

W.S.S.: 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)

W.S.S.: 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

W.S.S.: 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*)

W.S.S.: 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

Chapter Seven: Systems of Linear Equations and Inequalities

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

W.S.S.: 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

W.S.S.: 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*)

W.S.S.: 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

Chapter Eight: Exponents and Exponential Functions

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

W.S.S.: 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)

W.S.S.: 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*)

Chapter Nine: Quadratic Equations and Functions

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

W.S.S.: 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*)

W.S.S.: 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

Chapter Ten: Polynomials and Factoring

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

W.S.S.: 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)

Chapter Eleven: Rational Equations and Functions

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

W.S.S.: 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

W.S.S.: 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)

W.S.S.: 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)

W.S.S.: 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

W.S.S.: 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

Chapter Twelve: Radicals

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

W.S.S.: 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)