Roselle Park School District

Mathematics Department

Course of Study

Algebra 1 Honors
ALGEBRA I HONORS

The purpose of this guide is to provide the instructor with a scope and sequence and the course objectives. In order to understand how these objectives are to be achieved, a sequence of topics is listed for each unit. Space is provided on each page to allow for notes and recommendations. The New Jersey Core Curriculum Content Standards and the New Jersey Core Course Proficiencies are infused throughout the units.

This guide applies to all students and meets the Affirmative Action guidelines.

Written by:  
Susan Guercio  
Irene Baran  
Alex Gomez  
Anne Marciano  
Catherine Marshall  
Carol Spiesbach  
Janet Zahumeny  
Jennifer Zavacky

Edited by:  
Valarie Baker  
Supervisor of Curriculum and Instruction

July 2000
ROSELLE PARK PUBLIC SCHOOLS
MATHEMATICS PHILOSOPHY

Our children need to be well prepared for lives and careers in a technological world and in a global economy. They need to be able to solve problems and reason effectively. They need to use complex information and advanced tools. They need to know and understand how to use and apply mathematics. These high standards will benefit both our children and our society.

The Roselle Park High School Mathematics Curriculum will develop students’ understanding of concepts and help them to acquire essential skills. Their philosophy is based upon the fact that all students possess the ability to be rational thinkers, independent problem solvers, and efficient users of technology. Each student can achieve success and pride while developing these skills. A comprehensive program has been developed in a spiral and sequential format so that students will learn the many aspects of mathematics and its applications. Emphasis will be placed on being actively involved in learning mathematics, writing and talking about math, using critical thinking skills in problem solving, using calculators, computers, and other mathematical tools of learning, and achieving at a high level.

Consideration will be given to the individual student’s needs, interests, and abilities. All students must develop and sharpen their skills, deepen their understanding of mathematical concepts and processes, and hone their problem-solving, reasoning, and communication abilities while using mathematics to make sense of, and solve, compelling problem. For this to occur, rigorous mathematical content must be organized, taught, and assessed in a problem-solving environment. The students will be challenged to use math in meaningful ways, so that they come to realize how useful mathematics will be in their lives. Moreover, the curriculum will also encourage the development of positive attitudes and interests in mathematics, which will last a lifetime.
1. Communicate mathematically through written, oral, symbolic, and visual forms of expression.

2. Understand the interrelationships of mathematical ideas and the roles that mathematics plays in other disciplines and in life.

3. Use calculators, computers, manipulatives, and other mathematical tools to enhance mathematical thinking and understanding.

4. Develop the ability to pose and solve mathematical problems in mathematics, other disciplines, and everyday experiences.

5. Develop reasoning ability and become self-reliant, independent mathematical thinkers.

6. Demonstrate high levels of mathematical thought through experiences which extend beyond traditional computation, algebra, and geometry.

7. Develop an understanding of patterns, relationships, and functions, and use them to represent and explain real world phenomena.
I. Descriptions:

The objective of Algebra 1 is to provide a firm foundation in the skills and concepts of algebra, to prepare for more advanced courses in mathematics, to develop the ability to reason quantitatively, and to lead the students to appreciate the relationship between arithmetic and algebra.

Students may start the study of algebra as early as Grade 8. These students have been identified by tests and teacher recommendation for a pre-algebra course in Grade 7. The courses differ in the degree of difficulty of the exercises and the amount of time devoted to the more abstract topics.

II. Unit Topics:

- Introduction to Algebra
- Working with Real Numbers
- Solving Equations and Problems
- Polynomials
- Factoring Polynomials
- Fractions
- Applying Fractions
- Introduction to Functions
- System of Linear Equations
- Inequalities
- Rational and Irrational Numbers
- Quadratic Functions
III  Objectives:

1. To develop basic mathematical symbolism and terminology
2. To recognize the correlation between concrete examples and algebraic concepts
3. To use the four operations and the properties of real numbers to simplify numerical and algebraic expressions
4. To develop algebraic methods of solving equations and use these methods to solve word problems
5. To organize information provided in various types of word problems
6. To introduce the concept of exponents
7. To develop and apply the rules of exponents when adding, subtracting and multiplying polynomials
8. To apply these skills in problem solving
9. To factor composite numbers, monomials, and polynomials
10. To divide monomials
11. To use factoring and the zero-product property to solve polynomial equations and application problems
12. To use the four operations to simplify algebraic fractions and mixed expressions
13. To divide polynomials by using long division
14. To solve equations and word problems related to algebraic fractions
15. To solve equations with fractional coefficients and fractional equations
16. To graph linear equations
17. To write the equations of a line given a variety of information
18. To solve systems of linear equations and related word problems
19. To order and graph real numbers
20. To solve and graph inequalities in one variable
21. To simplify and perform operations with radicals
22. To distinguish between rational and irrational numbers
23. To solve quadratic functions
24. To graph quadratic functions
25. To solve a variety of variation problems
26. To review the skills needed to successfully take the GEPA/HSPA

IV  Types of Evaluations:

1. Tests
2. Quizzes
3. Class work /Notebooks
4. Class participation
5. Homework
6. Rubric based assessment
V Standards of Evaluation:
1. 90 - 100 A
2. 80 - 89 B
3. 70 - 79 C
4. 65 - 69 D
5. 0 - 64 F

VII Textbook:
Algebra 1
Larson Boswell Kanold Stiff
Copyright 2008
McDougall Littell

VIII Expectations:
1. Students are responsible for textbooks and other supplies necessary to complete class work.
2. Students will maintain notes required by teacher.
3. Students are expected to list and to follow all directions necessary to complete assignment.
4. Students will be responsible for acceptable performance such as class attendance, make-up work, and testing.
5. Students are responsible for efficient use of calculators, computers, manipulatives, and other mathematical tools.
6. Students will review daily homework and concepts
7. Students will organize review for tests including test-taking and test-preparation strategies.
8. Students will work effectively to complete group/individual assignments.
9. Students will review/take a mid-term and final.
4.1 All students will develop the ability to pose and solve mathematical problems in mathematics, other disciplines, and everyday experiences.

**Descriptive Statement:** Problem posing and problem solving involve examining situations that arise in mathematics and other disciplines and in common experiences, describing these situations mathematically, formulating appropriate mathematical questions, and using a variety of strategies to find solutions. By developing their problem-solving skills, students will come to realize the potential usefulness of mathematics in their lives.

Building upon knowledge and skills gained in the preceding grades, and demonstrating continued progress in Indicators 4, 5, 6, 7, 8, 12, and 14 above, by the end of **Grade 12**, students:

15. Use discovery-oriented, inquiry-based, and problem-centered approaches to investigate and understand the mathematical content appropriate to the high school grades.
16. Recognize, formulate, and solve problems arising from mathematical situations, everyday experiences, applications to other disciplines, and career applications.
17. Monitor their own progress toward problem solutions.
18. Explore the validity and efficiency of various problem-posing and problem-solving strategies, and develop alternative strategies and generalizations as needed.

4.2 All students will communicate mathematically through written, oral, symbolic and visual forms of expression.

**Descriptive Statement:** Communication of mathematical ideas will help students clarify and solidify their understanding of mathematics. By sharing their mathematical understandings in written and oral form with their classmates, teachers, and parents, students develop confidence in themselves as mathematics learners and enable teachers to better monitor their progress.

9. Formulate questions, conjectures, and generalizations about data, information, and problem situations.
10. Reflect on a clarify their thinking so as to present convincing arguments for their conclusions.

4.3 All students will connect mathematics to other learning by understanding the interrelationships of mathematical ideas and the roles that mathematics and mathematical modeling play in other disciplines and in life.
**Descriptive Statement:** Making connections enables students to see relationships between different topics, and to draw on those relationships in future study. This applies within mathematics, so that students can translate readily between fractions and decimals, or between algebra and geometry; to other content areas, so that students understand how mathematics is used in the sciences, the social sciences, and the arts; and to the everyday world, so that students can connect school mathematics to daily life.

12. Recognize how mathematics responds to the changing needs of society, through the study of the history of mathematics.

---

4.4 All students will develop reasoning ability and will become self-reliant, independent mathematical thinkers.

**Descriptive Statement:** Mathematical reasoning is the critical skill that enables a student to make use of all other mathematical skills. With the development of mathematical reasoning, students recognize that mathematics makes sense and can be understood. They learn how to evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize how those solutions can be applied. Mathematical reasoners are able to reflect on solutions to problems and determine whether or not they make sense. They appreciate the pervasive use and power of reasoning as a part of mathematics.

12. Make conjectures based on observation and information, and test mathematical conjectures, arguments, and proofs.
13. Formulate counter-examples to disprove an argument.

---

4.5 All students will regularly and routinely use calculators, computers, manipulatives, and other mathematical tools to enhance mathematical thinking, understanding, and power.

**Descriptive Statement:** Calculators, computers, manipulatives, and other mathematical tools need to be used by students in both instructional and assessment activities. These tools should be used, not to replace mental math and paper-and-pencil computational skills, but to enhance understanding of mathematics and the power to use mathematics. Historically, people have developed and used manipulatives (such as fingers, base ten blocks, geoboards, and algebra tiles) and mathematical devices (such as protractors, coordinate systems, and calculators) to help them understand and develop mathematics. Students should explore both new and familiar concepts with calculators and computers, but should also become proficient in using technology as it is used by adults, that is, for assistance in solving real-world problems.

8. Use calculators and computers effectively and efficiently in applying mathematical concepts and principles to various types of problems.
4.6 All students will develop number sense and an ability to represent numbers in a variety of forms and use numbers in diverse situations.

Descriptive Statement: Number sense is defined as an intuitive feel for numbers and a common sense approach to using them. It is a comfort with what numbers represent, coming from investigating their characteristics and using them in diverse situations. It involves an understanding of how different types of numbers, such as fractions and decimals, are related to each other, and how they can best be used to describe a particular situation. Number sense is an attribute of all successful users of mathematics.

20. Extend their understanding of the number system to include real numbers and an awareness of other number systems.
21. Develop conjectures and informal proofs of properties of number systems and sets of numbers.
22. Extend their intuitive grasp of number relationships, uses, and interpretations, and develop an ability to work with rational and irrational numbers.
23. Explore a variety of infinite sequences and informally evaluate their limits.

4.7 All students will develop spatial sense and an ability to use geometric properties and relationships to solve problems in mathematics and in everyday life.

Descriptive Statement: Spatial sense is an intuitive feel for shape and space. It involves the concepts of traditional geometry, including an ability to recognize, visualize, represent, and transform geometric shapes. It also involves other, less formal ways of looking at two- and three-dimensional space, such as paper-folding, transformations, tessellation’s, and projections. Geometry is all around us in art, nature, and the things we make. Students of geometry can apply their spatial sense and knowledge of the properties of shapes and space to the real world.

20. Understand and apply properties involving angles, parallel lines, and perpendicular lines.
21. Analyze properties of three-dimensional shapes by constructing models and by drawing and interpreting two-dimensional representations of them.
22. Use transformations, coordinates, and vectors to solve problems in Euclidean geometry.
23. Use basic trigonometric ratios to solve problems involving indirect measurement.
24. Solve real-world and mathematical problems using geometric models.
25. Use inductive and deductive reasoning to solve problems and to present reasonable explanations of and justifications for the solutions.
26. Analyze patterns produced by processes of geometric change, and express them in terms of iteration, approximation, limits, self-similarity, and fractals.
27. Explore applications of other geometry’s in real-world contexts.

4.8 All students will understand, select, and apply various methods of performing numerical operations.
Descriptive Statement: Numerical operations are an essential part of the mathematics curriculum. Students must be able to select and apply various computational methods, including mental math, estimation, paper-and-pencil techniques, and the use of calculators. Students must understand how to add, subtract, multiply, and divide whole numbers, fractions, and others kinds of numbers. With calculators that perform these operations quickly and accurately, however, the instructional emphasis now should be on understanding the meanings and uses of the operations, and on estimation and mental skills, rather than solely on developing paper-and-pencil skills.

13. Extend their understanding and use of operations to real numbers and algebraic procedures.

4.9 All students will develop an understanding of and will use measurement to describe and analyze phenomena.

Descriptive Statement: Measurement helps describe our world using numbers. We use numbers to describe simple things like length, weight, and temperature, but also complex things such as pressure, speed, and brightness. An understanding of how we attach numbers to those phenomena, familiarity with common measurement units like inches, liters, and miles per hour, and a practical knowledge of measurement tools and techniques are critical for students’ understanding of the world around them.

17. Use techniques of algebra, geometry, and trigonometry to measure quantities indirectly.
18. Use measurement appropriately in other subject areas and career-based contexts.
19. Choose appropriate techniques and tools to measure quantities in order to achieve specified degrees of precision, accuracy, and error (or tolerance) of measurements.

4.10 All students will use a variety of estimation strategies and recognize situations in which estimation is appropriate.

Descriptive Statement: Estimation is a process that is used constantly by mathematically capable adults, and that can be mastered easily by children. It involves an educated guess about a quantity or a measure, or an intelligent predication of the outcome of a computation. The growing use of calculators makes it more important than ever that students know when a computed answer is reasonable; the best way to make that decision is through estimation. Equally important is an awareness of the many situations in which an approximate answer is as good as, or even preferable to, an exact answer.

11. Estimate probabilities and predict outcomes from real-world data.
12. Recognize the limitations of estimation, assess the amount of error resulting from estimation, and determine whether the error is within acceptable tolerance limits.
4.11 All students will develop an understanding of patterns, relationships, and functions and will use them to represent and explain real-world phenomena.

**Descriptive Statement:** Patterns, relationships, and functions constitute a unifying theme of mathematics. From the earliest age, students should be encouraged to investigate the patterns that they find in numbers, shapes, and expressions, and, by doing so, to make mathematical discoveries. They should have opportunities to analyze, extend, and create a variety of patterns and to use pattern-based thinking to understand and represent mathematical and other real-world phenomena. These explorations present unlimited opportunities for problem-solving, making and verifying generalizations, and building mathematical understanding and confidence.

14. Analyze and describe how a change in an independent variable can produce a change in a dependent variable.
15. Use polynomial, rational, trigonometric, and exponential functions, to model real-world phenomena.
16. Recognize that a variety of phenomena can be modeled by the same type of function.
17. Analyze and explain the general properties and behavior of functions, and use appropriate graphing technologies to represent them.
18. Analyze the effects of changes in parameters on the graphs of functions.
19. Understand the role of functions as a unifying concept in mathematics.

4.12 All students will develop an understanding of statistics and probability and will use them to describe sets of data, model situations, and support appropriate inferences and arguments.

**Descriptive Statement:** Probability and statistics are the mathematics used to understand chance and to collect, organize, describe, and analyze numerical data. From weather reports to sophisticated studies of genetics, from election results to product preference surveys, probability and statistical language and concepts are increasingly present in the media and in everyday conversations. Students need this mathematics to help them judge the correctness of an argument supported by seemingly persuasive data.

17. Estimate probabilities and predict outcomes from actual data.
18. Understand sampling and recognize its role in statistical claims.
19. Evaluate bias, accuracy, and reasonableness of data in real-world contexts.
20. Understand and apply measures of dispersion and correlation.
21. Design a statistical experiment to study a problem, conduct the experiment, and interpret and communicate the outcomes.
22. Make predictions using curve fitting and numerical procedures to interpolate and extrapolate from known data.
23. Use relative frequency and probability, as appropriate, to represent and solve problems involving uncertainty.
24. Use simulations to estimate probabilities.
25. Create and interpret discrete and continuous probability distributions, and understand their application to real-world situations.
26. Describe the normal curve in general terms, and use its properties to answer questions about sets of data that are assumed to be normally distributed.
27. Understand and use the law of large numbers (that experimental results tend to approach theoretical probabilities after a large number of trials).

4.13 All students will develop an understanding of algebraic concepts and processes and will use them to represent and analyze relationships among variable quantities and to solve problems.

Descriptive Statement: Algebra is a language used to express mathematical relationships. Students need to understand how quantities are related to one another, and how algebra can be used to concisely express and analyze those relationships. Modern technology provides tools for supplementing the traditional focus on algebraic techniques, such as solving equations, with a more visual perspective, with graphs of equations displayed on a screen. Students can then focus on understanding the relationship between the equation and the graph, and on what the graph represents in a real-life situation.

14. Model and solve problems that involve varying quantities using variables, expressions, equations, inequalities, absolute values, vectors, and matrices.
15. Use tables and graphs as tools to interpret expressions, equations, and inequalities.
16. Develop, explain, use, and analyze procedures for operating on algebraic expressions and matrices.
17. Solve equations and inequalities of varying degrees using graphing calculators and computers as well as appropriate paper-and-pencil techniques.
18. Understand the logic and purposes of algebraic procedures.
19. Interpret algebraic equations and inequalities geometrically, and describe geometric objects algebraically.

4.14 All students will apply the concepts and methods of discrete mathematics to model and explore a variety of practical situations.

Descriptive Statement: Discrete mathematics is the branch of mathematics that deals with arrangements of distinct objects. It includes a wide variety of topics and techniques that arise in everyday life, such as how to find the best route from one city to another, where the objects are cities arranged on a map. It also includes how to count the number of different combinations of toppings for pizzas, how best to schedule a list of tasks to be done, and how computers store and retrieve arrangements of information on a screen. Discrete mathematics is the mathematics used by decision-makers in our society, from workers in government to those in health care, transportation, and telecommunications. Its various applications help students see the relevance of mathematics in the real world.
11. Understand the basic principles of iteration, recursion, and mathematical induction.
12. Use basic principles to solve combinatorial and algorithmic problems.
13. Use discrete models to represent and solve problems.
14. Analyze iterative processes with the aid of calculators and computers.
15. Apply discrete methods to storing, processing, and communicating information.
16. Apply discrete methods to problems of voting, apportionment, and allocations, and use fundamental strategies of optimization to solve problems.

4.15 All students will develop an understanding of the conceptual building blocks of calculus and will use them to model and analyze natural phenomena.

**Descriptive Statement:** The conceptual building blocks of calculus are important for everyone to understand. How quantities such as world population change, how fast they change, and what will happen if they keep changing at the same rate are questions that can be discussed by elementary school students. Another important topic for all mathematics students is the concept of infinity - what happens as numbers get larger and larger and what happens as patterns are continued indefinitely. Early explorations in these areas can broaden students’ interest in and understanding of an important area of applied mathematics.

12. Develop and use models based on sequences and series.
13. Develop and apply procedures for finding the sum of finite arithmetic series and of finite and infinite geometric series.
14. Develop an informal notion of limit.
15. Use linear, quadratic, trigonometric, and exponential models to explain growth and change in the natural world.
16. Recognize fundamental mathematical models (such as polynomial, exponential, and trigonometric functions) and apply basic translations, reflections, and dilation’s to their graphs.
17. Develop and explain the concept of the slope of a curve and use that concept to discuss the information contained in graphs.
18. Develop an understanding of the concept of continuity of a function.
19. Understand and apply approximation techniques to situations involving initial portions of infinite decimals and measurement.

4.16 All students will demonstrate high levels of mathematical thought through experiences which extend beyond traditional computation, algebra, and geometry.

**Descriptive Statement:** High expectations for all students form a critical part of the learning environment. The belief of teachers, administrators, and parents that a student can and will succeed in mathematics often makes it possible for that student to succeed. Beyond that, this standard calls for a commitment that all students will be continuously challenged and enabled to go as far mathematically as they can.
By the end of Grade 12, students:

1. Study a core curriculum containing challenging ideas and tasks, rather than one limited to repetitive, low-level cognitive activities.
2. Work at rich, open-ended problems which require them to use mathematics in meaningful ways, and which provide them with exciting and interesting mathematical experiences.
3. Recognize mathematics as integral to the development of all cultures and civilizations, and in particular to that of our own society.
4. Understand the important role that mathematics plays in their own success, regardless of career.
5. Interact frequently with parents and other members of their communities, including men and women from a variety of cultural backgrounds, who use mathematics in their daily lives and occupations.
6. Receive services that help them understand the mathematical skills and concepts necessary to assure success in the core curriculum.
7. Receive equitable treatment without regard to genre, ethnicity, or predetermined expectations for success.
8. Learn mathematics in classes which reflect the diversity of the school’s total student population.
9. Be provided with opportunities at all grade levels for further study of mathematics, especially including topics beyond traditional computation, algebra, and geometry.
10. Be challenged to maximize their mathematical achievements at all grade levels.
11. Experience a full program of meaningful mathematics so that they can pursue post-secondary education.
## SCOPE AND SEQUENCE

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intro to Alg.</td>
<td>Working with Real Numbers</td>
<td>Solving Equations and Problems</td>
<td>Polynomials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Factoring Polynomials</td>
<td></td>
<td>Fractions</td>
<td>Applying Fractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Applying Fractions continued</td>
<td>Introduction to Functions</td>
<td>GEPA Review</td>
<td>Systems of Linear Equations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Inequalities</td>
<td>Rational and Irrational Numbers</td>
<td>Quadratic Functions</td>
<td>Final Exam and Exam Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
UNIT I  Introduction to Algebra  Duration: 2 Days

A. Major Objectives:

1. To develop basic mathematical symbolism and terminology
2. To recognize the correlation between concrete examples and algebraic concepts

B. Sequence of Topics:

1. Simplify numerical expressions and evaluate algebraic expressions
2. Simplify expressions with and without grouping symbols
3. Find solution sets of equations over a given domain
4. Translate phrases into variable expressions
5. Translate word sentences into equations and solve word problems over a given domain
6. Graph and compare real numbers on a number line
7. Use opposites and absolute values

C. Core Material:

Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D. Supplemental Materials:

1. Dolciani – Practice Masters
2. Dolciani – Study Guide for Reteaching
3. Dolciani – Resource Book for Tests
5. Teacher made transparencies
6. Teacher made worksheets

E. Suggested Assignments, Projects, Field Trips, Speakers:

1. Complete exercises in textbook for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. GEPA Do Now

F. Suggested Assessments:

1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. **Alignment to New Jersey Core Curriculum Content Standards:**

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>1. 4.1</th>
<th>15, 16, 17, 18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. 4.2</td>
<td>9, 10</td>
</tr>
<tr>
<td></td>
<td>7. 4.3</td>
<td>11, 12</td>
</tr>
<tr>
<td></td>
<td>8. 4.6</td>
<td>20, 22</td>
</tr>
<tr>
<td></td>
<td>9. 4.8</td>
<td>13, 14</td>
</tr>
<tr>
<td></td>
<td>10. 4.9</td>
<td>17, 19</td>
</tr>
<tr>
<td></td>
<td>11. 4.15</td>
<td>14, 15, 16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross Content</th>
<th>1. 2</th>
<th>2, 7, 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. 3</td>
<td>1, 2, 3, 9, 10, 11, 13</td>
</tr>
<tr>
<td></td>
<td>3. 4</td>
<td>1, 2, 9, 10, 11</td>
</tr>
</tbody>
</table>
UNIT II  Working with Real Numbers  Duration:  7 days

A.  Major Objectives:
   1.  To use the four operations and the properties of real numbers to simplify
       Numerical and algebraic expressions

B.  Sequence of Topics:
   1.  Use number properties to simplify expressions
   2.  Add, subtract, multiply and divide real numbers
   3.  Use the distributive property to simplify expressions
   4.  Write equations to represent relationships among integers
   5.  Simplify expressions involving quotients

C.  Core Material:
    Algebra, Structure and Method, Book 1
    Brown, Dolciani, Sorgenfrey, Cole
    Houghton Mifflin, 1994

D.  Supplemental Materials:
   1.  Dolciani – Practice Masters
   2.  Dolciani – Study Guide for Reteaching
   3.  Dolciani – Resource Book for Tests
   5.  Teacher made transparencies
   6.  Teacher made worksheets

E.  Suggested Assignments, Projects, Field Trips, Speakers:
   1.  Complete exercises in textbook for each lesson
   2.  Complete practice worksheets
   3.  Use calculator/computer to complete classroom and homework problems
   4.  Complete/review chapter prior to test/quizzes using text and teacher made
       Materials
   5.  GEPA Do Now

F.  Suggested Assessments:
   1.  Test
   2.  Quizzes
   3.  Class participation
   4.  Notebook/classwork
   5.  Homework
G. **Alignment to New Jersey Core Curriculum Content Standards:**

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>1.  4.1</th>
<th>15, 16, 17, 18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.  4.3</td>
<td>11, 12</td>
</tr>
<tr>
<td></td>
<td>3.  4.6</td>
<td><strong>20, 22</strong></td>
</tr>
<tr>
<td></td>
<td>4.  4.8</td>
<td>13, 14</td>
</tr>
<tr>
<td></td>
<td>5.  4.13</td>
<td>14, 15, 16, 17, 18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross Content</th>
<th>1.  2</th>
<th>2, 7, 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.  3</td>
<td>1, 2, 3, 9, 10, 11, 13</td>
</tr>
<tr>
<td></td>
<td>3.  4</td>
<td>1, 2, 9, 10, 11</td>
</tr>
</tbody>
</table>
UNIT III  Solving Equations and Problems  Duration:  17 days

A.  Major Objectives:

1.  To develop algebraic methods of solving equations and use these methods
    Solve word problems
2.  To organize information provided in various types of word problems

B.  Sequence of Topics:

1.  Solve equations using addition, subtraction, multiplication or division
2.  Solve equations using more than one transformation
3.  Solve word problems using equations
4.  Solve equations with the variable on both sides
5.  Solve problems involving cost, income, and value

C.  Core Material:

Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D.  Supplemental Materials:

1.  Dolciani – Practice Masters
2.  Dolciani – Study Guide for Reteaching
3.  Dolciani – Resource Book for Tests
5.  Teacher made transparencies
6.  Teacher made worksheets

E.  Suggested Assignments, Projects, Field Trips, Speakers:

1.  Complete exercises in textbook for each lesson
2.  Complete practice worksheets
3.  Use calculator/computer to complete classroom and homework problems
4.  Complete/review chapter prior to test/quizzes using text and teacher made Materials
5.  GEPA Do Now

F.  Suggested Assessments:

1.  Test
2.  Quizzes
3.  Class participation
4. Notebook/classwork
5. Homework

G. Alignment to New Jersey Core Curriculum Content Standards:

Mathematics
1. 4.1  15, 16, 17, 18
2. 4.2  9, 10
3. 4.3  11, 12
5. 4.5  8
6. 4.8  13, 14
7. 4.10 12
8. 4.13 14, 15, 16, 17, 18

Cross Content
1. 2  2, 7, 10
2. 3  1, 2, 3, 9, 10, 11, 13
3. 4  1, 2, 9, 10, 11
UNIT IV  Polynomials  Duration:  17 days

A.  Major Objectives:

1.  To introduce the concept of exponents
2.  To develop and apply the rules of exponents when adding, subtracting and multiplying polynomials
3.  To apply these skills in problem solving

B.  Sequence of Topics:

1.  Write and simplify expressions involving exponents
2.  Add and subtract polynomials
3.  Multiply polynomials
4.  Find powers of monomials
5.  Multiply a polynomial by a monomial
6.  Multiply polynomials
7.  Solve literal equations
8.  Solve word problems involving uniform motion and area

C.  Core Material:

Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D.  Supplemental Materials:

1.  Dolciani – Practice Masters
2.  Dolciani – Study Guide for Reteaching
3.  Dolciani – Resource Book for Tests
5.  Teacher made transparencies
6.  Teacher made worksheets

E.  Suggested Assignments, Projects, Field Trips, Speakers:

1.  Complete exercises in textbook for each lesson
2.  Complete practice worksheets
3.  Use calculator/computer to complete classroom and homework problems
4.  Complete/review chapter prior to test/quizzes using text and teacher made materials
5.  GEPA Do Now
F. **Suggested Assessments:**
1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. **Alignment to New Jersey Core Curriculum Content Standards:**

**Mathematics**

1. 4.1 15, 16, 17, 18
2. 4.3 11, 12
3. 4.4 12, 13
4. 4.5 8
5. 4.7 20, 21, 24
6. 4.8 13, 14
7. 4.13 14, 15, 16, 17, 18

**Cross Content**

1. 2 2, 7, 10
2. 3 1, 2, 3, 9, 10, 11, 13
3. 4 1, 2, 9, 10, 11
UNIT V  Factoring Polynomials  Duration:  25 days

A.  Major Objectives:

1.  To factor composite numbers, monomials, and polynomials
2.  To divide monomials
3.  To use factoring and the zero-product property to solve polynomial equations and application problems

B.  Sequence of Topics:

1.  Factor integers and find GCF of integers
2.  Simplify quotients of monomials and find GCF of monomials
3.  Divide polynomials by monomials and find monomial factors
4.  Factor differences of two squares
5.  Factor perfect square trinomials
6.  Factor quadratic trinomials
7.  Factor a polynomial by grouping
8.  Factor polynomials completely and solve equations
9.  Solve problems by writing and factoring quadratic equations

C.  Core Material:
Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D.  Supplemental Materials:

1.  Dolciani – Practice Masters
8.  2.  Dolciani – Study Guide for Reteaching
9.  3.  Dolciani – Resource Book for Tests
11.  5.  Teacher made transparencies
6.  Teacher made worksheets

E.  Suggested Assignments, Projects, Field Trips, Speakers:
1.  Complete exercises in textbook for each lesson
2.  Complete practice worksheets
3.  Use calculator/computer to complete classroom and homework problems
4.  Complete/review chapter prior to test/quizzes using text and teacher made Materials
5.  GEPA Do Now
F. **Suggested Assessments:**

1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. **Alignment to New Jersey Core Curriculum Content Standards:**

**Mathematics**

1. 4.1 15, 16, 17, 18
2. 4.2 9, 10
3. 4.3 11, 12
4. 4.5 8
5. 4.6 20, 22
6. 4.7 20, 21, 24
7. 4.11 14, 15, 16, 17
8. 4.13 14, 15, 16, 17, 18

**Cross Content**

1. 2 2, 7, 10
2. 3 1, 2, 3, 9, 10, 11, 13
3. 4 1, 2, 9, 10, 11
UNIT VI Fractions Duration: 15 days

A. Major Objectives:

1. To use the four operations to simplify algebraic fractions and mixed expressions
2. To divide polynomials by using long division

B. Sequence of Topics:

1. Simplify algebraic fractions
2. Multiply and divide algebraic fractions
3. Add and subtract algebraic fractions
4. Write mixed expressions as fractions in simplest form
5. Divide polynomials
6. Simplify complex fractions

C. Core Material:
Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D. Supplemental Materials:

1. Dolciani – Practice Masters
2. Dolciani – Study Guide for Reteaching
3. Dolciani – Resource Book for Tests
5. Teacher made transparencies
6. Teacher made worksheets

E. Suggested Assignments, Projects, Field Trips, Speakers:

1. Complete exercises in textbook for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. GEPA Do Now

F. Suggested Assessments:

1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. Alignment to New Jersey Core Curriculum Content Standards:

<table>
<thead>
<tr>
<th>Mathematics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 4.5</td>
<td>8</td>
</tr>
<tr>
<td>2. 4.8</td>
<td>13, 14</td>
</tr>
<tr>
<td>3. 4.13</td>
<td>14, 15, 16, 17, 18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross Content</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2</td>
<td>2, 7, 10</td>
</tr>
<tr>
<td>2. 3</td>
<td>1, 2, 3, 9, 10, 11, 13</td>
</tr>
<tr>
<td>3. 4</td>
<td>1, 2, 9, 10, 11</td>
</tr>
</tbody>
</table>
UNIT VII Applying Fractions Duration: 13 days

A. Major Objectives:

1. To solve equations and word problems related to algebraic fractions
2. To solve equations with fractional coefficients and fractional equations

B. Sequence of Topics:

1. Solve problems involving ratios
2. Solve problems using proportions
3. Solve equations with fractional coefficients
4. Solve fractional equations
5. Work with percents and decimals
6. Use negative exponents
7. Use scientific notation
   *denotes concepts covered by the Honors Algebra I course

C. Core Material:
   Algebra, Structure and Method, Book 1
   Brown, Dolciani, Sorgenfrey, Cole
   Houghton Mifflin, 1994

D. Supplemental Materials:

1. Dolciani – Practice Masters
2. Dolciani – Study Guide for Reteaching
3. Dolciani – Resource Book for Tests
5. Teacher made transparencies
6. Teacher made worksheets

E. Suggested Assignments, Projects, Field Trips, Speakers:

1. Complete exercises in textbook for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. GEPA Do Now

F. Suggested Assessments:

1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. **Alignment to New Jersey Core Curriculum Content Standards:**

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 4.1</td>
<td>15, 16, 17, 18</td>
</tr>
<tr>
<td>2. 4.3</td>
<td>11, 12</td>
</tr>
<tr>
<td>3. 4.5</td>
<td>8</td>
</tr>
<tr>
<td>4. 4.6</td>
<td>20, 22</td>
</tr>
<tr>
<td>5. 4.12</td>
<td>17, 18</td>
</tr>
<tr>
<td>6. 4.13</td>
<td>14, 15, 16, 17, 18</td>
</tr>
<tr>
<td>7. 4.16</td>
<td>1, 2, 3, 4, 6, 7, 11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross Content</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2</td>
<td>2, 7, 10</td>
</tr>
<tr>
<td>2. 3</td>
<td>1, 2, 3, 9, 10, 11, 13</td>
</tr>
<tr>
<td>3. 4</td>
<td>1, 2, 9, 10, 11</td>
</tr>
</tbody>
</table>
UNIT VIII  Introduction to Functions  Duration:  13 days

A. Major Objectives:

1. To graph linear equations
2. To write the equations of a line given a variety of information

B. Sequence of Topics:

1. Solve equations in two variables over given domains of the variables
2. Graph ordered pairs and linear equations in two variables
3. Find the slope of a line
4. Find the slope-intercept form of a linear equation
5. Find an equation of a line given: slope, point or two points
6. Understand functions and define by using tables and graphs
7. Define a function using equations
8. Use direct/inverse variation to solve problems

C. Core Material:

Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D. Supplemental Materials:

1. Dolciani – Practice Masters
2. Dolciani – Study Guide for Reteaching
3. Dolciani – Resource Book for Tests
5. Teacher made transparencies
6. Teacher made worksheets

E. Suggested Assignments, Projects, Field Trips, Speakers:

1. Complete exercises in textbook for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. GEPA Do Now

F. Suggested Assessments:

1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. Alignment to New Jersey Core Curriculum Content Standards:
Mathematics
1. 4.1 15, 16, 17, 18
2. 4.3 11, 12
3. 4.5 8
4. 4.6 20, 22
5. 4.7 20, 21, 24
6. 4.8 13, 14
7. 4.11 14, 15, 16, 17
8. 4.12 17, 18
9. 4.13 14, 15, 16, 17, 18
10. 4.14 12, 13
Cross Content
1. 2 2, 7, 10
2. 3 1, 2, 3, 9, 10, 11, 13
3. 4 1, 2, 9, 10, 11
UNIT IX  System of Linear Equations  Duration: 15 days

A. Major Objectives:
1. To solve systems of linear equations and related word problems

B. Sequence of Topics:
1. Use graphs to solve systems of linear equations
2. Use the substitution method to solve systems of linear equations
3. Use systems of linear equations in two variables to solve problems
4. Use addition/subtraction to solve systems in two variables
5. Use multiplication with the addition/subtraction method

C. Core Material:
Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D. Supplemental Materials:
1. Dolciani – Practice Masters
2. Dolciani – Study Guide for Reteaching
3. Dolciani – Resource Book for Tests
5. Teacher made transparencies
6. Teacher made worksheets

E. Suggested Assignments, Projects, Field Trips, Speakers:
1. Complete exercises in textbook for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. GEPA Do Now

F. Suggested Assessments:
1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework
G. **Alignment to New Jersey Core Curriculum Content Standards:**

<table>
<thead>
<tr>
<th>Mathematics</th>
<th>1. 4.1</th>
<th>15, 16, 17, 18</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. 4.2</td>
<td>9, 10</td>
</tr>
<tr>
<td></td>
<td>3. 4.3</td>
<td>11, 12</td>
</tr>
<tr>
<td></td>
<td>4. 4.5</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>5. 4.7</td>
<td>20, 21, 24</td>
</tr>
<tr>
<td></td>
<td>6. 4.8</td>
<td>13, 14</td>
</tr>
<tr>
<td></td>
<td>7. 4.13</td>
<td>14, 15, 16, 17, 18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cross Content</th>
<th>1. 2</th>
<th>2, 7, 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. 3</td>
<td>1, 2, 3, 9, 10, 11, 13</td>
</tr>
<tr>
<td></td>
<td>3. 4</td>
<td>1, 2, 9, 10, 11</td>
</tr>
</tbody>
</table>
UNIT X  Inequalities  Duration:  11 days

A.  Major Objectives:
1.  To order and graph real numbers
2.  To solve and graph inequalities in one variable

B.  Sequence of Topics:
1.  Review the concept of order and graph inequalities in one variable
2.  Transform inequalities in order to solve them
3.  Solve problems that involve inequalities
4.  Graph linear inequalities in two variables
5.  Graph the solution set of a system of linear inequalities
6.  Find the solution sets of combined inequalities
7.  Solve equations and inequalities involving absolute value

C.  Core Material:
Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D.  Supplemental Materials:
1.  Dolciani – Practice Masters
2.  Dolciani – Study Guide for Reteaching
3.  Dolciani – Resource Book for Tests
5.  Teacher made transparencies
6.  Teacher made worksheets

E.  Suggested Assignments, Projects, Field Trips, Speakers:
1.  Complete exercises in textbook for each lesson
2.  Complete practice worksheets
3.  Use calculator/computer to complete classroom and homework problems
4.  Complete/review chapter prior to test/quizzes using text and teacher made materials
5.  GEPA Do Now

F.  Suggested Assessments:
1.  Test
2.  Quizzes
3.  Class participation
4.  Notebook/classwork
G. Alignment to New Jersey Core Curriculum Content Standards:
Mathematics
1. 4.1 15, 16, 17, 18
2. 4.2 9, 10
3. 4.3 11, 12
4. 4.5 8
5. 4.6 20, 22
6. 4.13 14, 15, 16, 17, 18
7. 4.15 14, 15, 16
Cross Content
1. 2 2, 7, 10
2. 3 1, 2, 3, 9, 10, 11, 13
3. 4 1, 2, 9, 10, 11
UNIT XI  Rational and Irrational Numbers  Duration:  13 days

A.  Major Objectives:

1.  To simplify and perform operations with radicals
2.  To distinguish between rational and irrational numbers
3.  To use the pythagorean theorem
4.  To solve radical equations

B.  Sequence of Topics:

1.  Learn and apply some properties of rational numbers
2.  Express rational numbers as decimals or fractions
3.  Find the square roots of that have rational square roots
4.  Simplify radicals and find decimal approximations of irrational square roots
5.  Find square roots of variable expressions and use to solve equations
6.  Simplify products and quotients of radicals
7.  Simplify sums and differences of radicals
8.  Multiply binomials containing square root radicals and rationalize binomial denominators containing square root radicals
9.  Use the pythagorean theorem to solve geometric problems
10.  Solve simple radical equations

C.  Core Material:

Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D.  Supplemental Materials:

1.  Dolciani – Practice Masters
2.  Dolciani – Study Guide for Reteaching
3.  Dolciani – Resource Book for Tests
5.  Teacher made transparencies
6.  Teacher made worksheets

E.  Suggested Assignments, Projects, Field Trips, Speakers:

1.  Complete exercises in textbook for each lesson
2.  Complete practice worksheets
3.  Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials

5. GEPA Do Now

F. Suggested Assessments:
   1. Test
   2. Quizzes
   3. Class participation
   4. Notebook/classwork
   5. Homework

G. Alignment to New Jersey Core Curriculum Content Standards:
   Mathematics
   1. 4.1  15, 16, 17, 18
   2. 4.2  9, 10
   3. 4.3  11, 12
   4. 4.4  12, 13
   5. 4.5  8
   6. 4.6  20, 22
   7. 4.8  13, 14
   8. 4.10 12
   9. 4.13 14, 15, 16, 17, 18
  10. 4.14 12, 13
  11. 4.16 1, 2, 3, 4, 6, 7, 11
   Cross Content
   1. 2  2, 7, 10
   2. 3  1, 2, 3, 9, 10, 11, 13
   3. 4  1, 2, 9, 10, 11
UNIT XII. Quadratic Equations Duration: 10 days

A. **Major Objectives:**

1. To solve quadratic equations
2. To graph quadratic functions
3. To solve a variety of variation problems

B. **Sequence of Topics:**

1. Quadratic equations with perfect squares
2. Completing the square
3. The quadratic formula
4. Graphs of quadratic equations
5. Methods of solution
6. Solving problems involving quadratic equations
7. Direct and inverse variation involving squares
8. Joint and combined variation

C. **Core Material:**

Algebra, Structure and Method, Book 1
Brown, Dolciani, Sorgenfrey, Cole
Houghton Mifflin, 1994

D. **Supplemental Materials:**

1. Dolciani – Practice Masters
2. Dolciani – Study Guide for Reteaching
3. Dolciani – Resource Book for Tests
5. Teacher made transparencies
6. Teacher made worksheets

E. **Suggested Assignments, Projects, Field Trips, Speakers:**

1. Complete exercises in textbook for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. GEPA Do Now

F. **Suggested Assessments:**

1. Test
2. Quizzes
3. Class participation
4. Notebook/classwork
5. Homework

G. Alignment to New Jersey Core Curriculum Content Standards:

Mathematics
1. 4.1 15, 16, 17, 18
2. 4.2 9, 10
3. 4.5 8
4. 4.6 20, 22
5. 4.8 13, 14
6. 4.10 12
7. 4.13 14, 15, 16, 17, 18, 19
8. 4.16 1, 2, 3, 4, 6, 7, 11

Cross Content
4. 2 2, 7, 10
5. 3 1, 2, 3, 9, 10, 11, 13
6. 4 1, 2, 9, 10, 11
UNIT XII

GEPA SKILLS

Duration: 10 days

A. Major Objectives:

1. To review the skills needed to successfully take the GEPA

B. Sequence of Topics:

1. Number sense, concepts and applications
2. Spatial sense and Geometry
3. Data Analysis, Probability, Statistics, and Discrete Math
4. Patterns, functions, and Algebra

C. Core Material:

GEPA Mathematics Coach
Mervine Edwards, EDI, 2000

D. Supplemental Materials:

1. GEPA Success in Mathematics Level H, Steck-Vaughn/ Berrent, 2000
2. GEPA success Work A Text in Mathematics, Instructivision 1998
3. Released materials from the state
4. Teacher made transparencies
5. Teacher made worksheets

E. Suggested Assignments, Projects, Field Trips, Speakers:

1. Complete exercises in text for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework assignments
4. Complete/review chapter prior to test/quizzes using text and teacher made `materials
5. Do Now

F. Suggested Assessments:

1. Test
2. Quizzes
3. Notebook/classwork
4. Rubric based assessment
5. Class participation
6. Homework

G. Alignment to New Jersey Core Curriculum Content Standards:
Mathematics

41
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.1</td>
<td>15, 16, 17, 18</td>
</tr>
<tr>
<td>2.</td>
<td>4.2</td>
<td>9, 10</td>
</tr>
<tr>
<td>3.</td>
<td>4.3</td>
<td>11, 12</td>
</tr>
<tr>
<td>4.</td>
<td>4.4</td>
<td>12, 13</td>
</tr>
<tr>
<td>5.</td>
<td>4.5</td>
<td>8</td>
</tr>
<tr>
<td>6.</td>
<td>4.6</td>
<td>20, 22</td>
</tr>
<tr>
<td>7.</td>
<td>4.7</td>
<td>20, 21, 24</td>
</tr>
<tr>
<td>8.</td>
<td>4.8</td>
<td>13, 14</td>
</tr>
<tr>
<td>9.</td>
<td>4.9</td>
<td>17, 19</td>
</tr>
<tr>
<td>10.</td>
<td>4.10</td>
<td>12</td>
</tr>
<tr>
<td>11.</td>
<td>4.11</td>
<td>14, 15, 16, 17, 18</td>
</tr>
<tr>
<td>12.</td>
<td>4.12</td>
<td>17, 18</td>
</tr>
<tr>
<td>13.</td>
<td>4.13</td>
<td>14, 15, 16, 17, 18</td>
</tr>
<tr>
<td>14.</td>
<td>4.14</td>
<td>12, 13</td>
</tr>
<tr>
<td>15.</td>
<td>4.15</td>
<td>14, 15, 16</td>
</tr>
<tr>
<td>16.</td>
<td>4.16</td>
<td>1, 2, 3, 4, 6, 7, 11</td>
</tr>
</tbody>
</table>

**Cross Content**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2</td>
<td>2, 7, 10</td>
</tr>
<tr>
<td>2.</td>
<td>3</td>
<td>1, 2, 3, 9, 10, 11, 13</td>
</tr>
<tr>
<td>3.</td>
<td>4</td>
<td>1, 2, 9, 10, 11</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY


