

**CANON CITY HIGH SCHOOL
COURSE GUIDE**

Department: Math

Course Title: Algebra 1B

Date: 8-26-03

Grade Level: 9-10

Prerequisite/Requirements: C or better in Algebra 1A or Orleans-Hanna > 86 and pass Algebra 1A advancement test.

Costs to Students: Scientific calculator, 3 ring binder, graph paper, ruler, protractor, paper, and pencils

Course Description:

This course permits the student to master the following topics of Algebra: algebraic fractions, ratios, proportions, inverse variations, percent, operations and factoring of polynomials, systems of equations, inequalities, radical expressions, quadratic equations, and basic trig functions.

General Course Outcomes:

Upon completion of this course the proficient student will know and be able to: (core concepts/essential skills).

1. Solve systems of linear equations and inequalities and check the solutions reasonableness.
2. Manipulate exponential expressions and then apply these rules using scientific notation, exponential growth and decay.
3. Learn rules to evaluate and simplify radicals and then apply these rules to solving and graphing quadratics and radical equations.
4. Use addition, subtraction, multiplying, and factoring to solve polynomial equations.
5. Solve, add, subtract, multiply, divide, and graph rational expressions, equations, and functions.

Standards:

List State Standards addressed in this course. (Identify the course outcomes that support those standards.)

Standard 1: Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.

What the students will know or be able to do includes:

- Demonstrating meanings for real numbers, absolute value, and scientific notation using physical materials and technology in problem-solving situations;
- Developing, testing, and explaining conjectures about properties of number systems and sets of numbers; and
- Using number sense to estimate and justify the reasonableness of solutions to problems involving real numbers.

Standard 2: Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicates the reasoning used in solving these problems.

What the students will know or be able to do includes:

- Modeling real-world phenomena using functions, equations, inequalities, and matrices;
- Representing functional relationships using written explanations, tables, equations, and graphs, and describing the connections among these representations;
- Solving problems involving functional relationships using computers as well as appropriate paper-and-pencil techniques;
- Analyzing and explaining the behaviors, transformations, and general properties of types of equations and functions; and
- Interpreting algebraic equations and inequalities geometrically and describing geometric relationships algebraically.

Standard 3: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.

What the students will know or be able to do includes:

- Designing and conducting a statistical experiment to study a problem, and interpreting and communicating the results using the appropriate technology;
- Analyzing statistical claims for erroneous conclusions or distortions;
- Fitting curves to scatter plots, using informal methods or appropriate technology, to determine the strength of the relationship between two data sets and to make predictions;
- Drawing conclusions about distributions of data based on analysis of statistical summaries;
- Using experimental and theoretical probability to represent and solve problems involving uncertainty; and
- Solving real-world problems with informal use of combinations and permutations.

Standard 4: Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.

What the students will know or be able to do includes:

- Finding and analyzing relationships among geometric figures using transformations in coordinate systems;
- Deriving and using methods to measure perimeter, area, and volume of regular and irregular geometric figures;
- Making and testing conjectures about geometric shapes and their properties, incorporating technology where appropriate; and
- Using trigonometric ratios in problem-solving situations.

Standard 5: Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.

What the students will know or be able to do includes:

- Measuring quantities indirectly using techniques of algebra, geometry, or trigonometry;
- Selecting and using appropriate techniques and tools to measure quantities in order to achieve specified degrees of precision, accuracy, and error of measurements; and
- Determining the degree of accuracy of a measurement.

Standard 6: Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.

What the students will know or be able to do includes:

- Using ratios, proportions, and percents in problem-solving situations;
- Selecting and using appropriate methods for computing with real numbers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil calculator, and computer methods, and determining whether the results are reasonable; and
- Describing the limitations of estimation, and assessing the amount of error resulting from estimation within acceptable limits.

Required Unit of Study:

Themes within the course/Specific concepts being targeted

The student will explore different types of functions. By continuing with linear systems, the students will solve systems of linear equations and inequalities. The rest of the course will progress to quadratic functions, polynomials, rational functions, and radical functions. Within each topic the components necessary to manipulate and interpret these functions will be explored.

Unit Modifications/Enrichments:

- **Assistance to students having difficulty and/or special needs**
 1. Multiple English to Spanish guides including audio CD
 2. Basic Skills Workbook: Diagnosis and Remediation
 3. Reteaching worksheets in each chapter resource book
 4. “Student Tutor” CD-Rom
 5. www.mcdougallittel.com

- **Additional experiences for students capable of advanced work (cooperative learning, adaptive materials, re-teaching, second chance, etc.**
 1. “Explorations and projects” workbook
 2. Challenge problems embedded in text
 3. Web site (www.mcdougallittel.com) offers further challenge problems

Materials/Resources:

- **Textbook (CORE and Supplemental) (Publisher, Edition, Year Adopted)**
Algebra 1, McDougal Little, 1st ed, 2003
- **Media materials used**
CD-Rom, internet, and video
- **Technology needs**
Overhead, computers and TV/VCR
- **Other resources (guest speakers, field trips)**

Assessment Program

Publisher Developed (list test)

Test and Practice Generator CD-Rom
Unit Resource Books
Warm-up/Daily Quiz Transparency

Teacher Developed

Individualized per teacher

- **Tests and Quizzes, Homework**

See Publisher Developed above for Tests and Quizzes
Homework from text.
Unit resource books have worksheets at three different levels for each section.
Within the unit resource books there are Challenge Skills worksheets, Interdisciplinary worksheets, and project ideas for higher level learning or alternate assessment.

- **Type: Essay, constructed response, criterion referred, oral presentation**
 - **Notebook**

Students are required to keep an organized notebook with daily notes, assignments, and any assigned projects.

- **Authentic production**

- **Proficiency Test Requirement**

None

Instructional time:

List units or interdisciplinary themes and approximate length of time (actual or percent, etc.)

1. Systems of linear equations and inequalities 1-3 weeks
2. Exponents and exponential functions 1-3 weeks
3. Quadratic equations and functions 1-3 weeks
4. Polynomials and factoring 1-3 weeks
5. Rational equations and functions 1-3 weeks
6. Radical expressions and equations 1-3 weeks