

Prentice Hall Mathematics, Algebra 2 © 2009
Correlated to:
Washington Mathematics Standards, Algebra 2 (2008)

Prentice Hall Mathematics, Algebra 2 Program Organization

Prentice Hall Mathematics supports student comprehension of the mathematics by providing well organized sequence of the content, structure of the daily lesson, systematic direct instruction, and teacher support provided for each lesson.

Content Sequence - Prentice Hall is organized with the goal of addressing all of the mathematics standards through direct and effective instruction, building concept upon concept, skill upon skill in an order that is pedagogically sound. The Table of Contents shows the smooth flow of the book, with prerequisite skills and concepts presented before the more complex topics that depend on them.

Starting the Chapter - Every chapter begins by reviewing the previous standards that have been learned and overviewing the standards that will be covered in the chapter. New Vocabulary is identified to prepare students for the chapter. Finally, *Check Your Readiness* questions assess student understanding of necessary prerequisite skills and identifies which lesson they can go to for any necessary remediation.

Lesson Organization - The daily lesson is structured and presented in a consistent format that enables teachers to effectively present the content and monitor student understanding.

- The **Instant Check System** is a system of assessments that helps ensure standards mastery. It is comprised of assessments to use before, during, and after instruction so teachers can easily and effectively monitor student understanding.
 - Each lesson begins with *Check Skills You'll Need* to ensure students have the necessary prerequisite skills for success in the lesson. A Go for Help reference directs them to a previous lesson if remediation is necessary.
 - *Check Skills* questions after every single example provide a way to check student understanding during instruction.
 - Finally, *Checkpoint Quizzes* occur after instruction to continually monitor student progress.
- **Daily Standards Practice** is provided with a comprehensive exercise set following every lesson. Each exercise set is leveled to ensure a variety of practice. **Test Prep and Mixed Review** ensures students also have a daily opportunity to practice concepts and skills previously mastered.

Concluding the Chapter - The following features conclude each chapter, providing opportunities for students to review all standards and demonstrate mastery. This part of the systematic instruction provides regular opportunities for review and practice and ensures focus on and mastery of the Standards.

- **Chapter Review** – The Chapter Review serves as a chapter study guide for students by reviewing the key concepts covered in each lesson and providing an opportunity to practice. In addition, key vocabulary is reviewed.
- **Chapter Test** – Students demonstrate their understanding of the entire chapter by completing this practice chapter test.
- **Standardized Test Prep Cumulative Practice** – This provides a regular opportunity for students to practice and demonstrate mastery of all the standards that have been covered. If remediation is necessary, students are directed to a previous lesson where each concept was taught.

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Assessment

Prentice Hall Mathematics provides teachers with the assessment tools needed to inform instruction and document student progress.

The **Progress Monitoring Assessments** contains all the program assessments needed to evaluate student understanding, monitor student progress, and inform future instruction. The following assessments are included:

- **Formative Assessments**
 - Screening Test – check student readiness at the beginning of the school year
 - Benchmark Tests – monitor student progress
 - Test-Taking Strategy Practice Masters – provide opportunities to improve problem-solving skills
- **Summative Assessments** – *All the summative assessments are provided in two forms – on-level and basic versions. Both forms fully assess student progress on the course content, but the basic versions have been modified for special needs students.*
 - Quarter Tests – on-level and basic versions
 - Mid-Course Tests – on-level and basic versions
 - Final Tests – on-level and basic versions

The **Test Preparation Workbook** contains review lessons and multiple-choice practice tests.

Technology, such as the **ExamView® CD-ROM**, allows teachers to create customized assessment, with all test items correlated to state standards.

Universal Access

Prentice Hall Mathematics provides better solutions for meeting the needs of every student in the classroom. Universal Access can be fostered by modifying instruction to address individual needs, and provided adapted resources when appropriate. Prentice Hall uses a systematic method for labeling and identifying resources and instructional support. This consistency helps teachers easily identify and choose the appropriate support for specific populations of students. The Teacher's Edition provides universal access strategies in detailed daily lesson plans, and daily teaching notes to help differentiate the lesson for all learners, including special needs, below level, advanced and English Language Learners. Chapter-level support pages provide teachers with an easy-to-read overview of the chapter resources available and suggest ways in the instructional lesson to use the resources. Key ancillaries to support universal access include the All-in-One Teaching Resources and the All-in-One Student Workbooks. The Teaching Resources include leveled practice for every lesson and daily activity labs. The All-in-One Student Workbook, available as both on-level and adapted for special needs, includes daily notetaking, daily practice, daily guided problem solving, and vocabulary support.

Instructional Planning and Support

Prentice Hall Mathematics is designed to provide teachers the tools needed to effectively and easily implement the program in the classroom.

A Road Map for Planning the Year - A Leveled Pacing Chart is provided in the Teacher's Edition that lays out a plan for teaching all the mathematics content standards. It suggests time to spend on each Chapter, and offers support for adjusting the instruction to meeting the pacing needs of all students.

Planning a Chapter - The Teacher's Edition begins each chapter with a series of planning pages. These pages provide an overview of the chapter and make it easy to determine how to individualize lessons for specific students.

Planning Daily Instruction - Teachers can use a variety of program materials to organize their teaching. The primary planning tools are the Teacher's Edition and the Teacher Center Planning CD-

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ROM. The Teacher's Edition includes step-by-step, daily support for directing instruction. Support is organized systematically around a 4-step teaching plan of Plan, Teach, Practice, and Assess/Reteach.

Instructional Tools to Plan, Teach, and Assess:

- **Core Components**
 - **Student Edition** – Thorough coverage of the standards, with built-in assessments and ongoing student support
 - **Teacher's Edition** – Provides comprehensive support for planning, teaching, and providing Universal Access
- **Teacher Support**
 - **All-in-One Teaching Resources** - All teaching resources are in one convenient place. Includes leveled practice, chapter projects, alternative assessments, cumulative reviews, guided problem solving masters, and vocabulary support.
 - **Progress Monitoring Assessments** – Provides support for formative and summative assessment, with comprehensive resources for monitoring progress on the standards.
 - **Test Preparation Workbook** – Provides instruction and practice on specific test taking strategies.
 - **Teacher Center CD-ROM** – The one-stop solution for planning, teaching, and assessing. The following resources are part of the Teacher Center:
 - **Planning CD-ROM** – Powerful lesson planning software, Teacher's Edition, and Teaching Resources.
 - **Presentation CD-ROM** – Complete support for digital presentations of lessons including videos, activities, stepped-out examples, quick check assessments, and online active math
 - **MindPoint Quiz Show** – Animated game show review for chapter level mathematics
 - **ExamView Test Generator CD-ROM** – Allows teachers to quickly and easily generate tests correlated to the standards.
- **Student Support**
 - **All-in-One Student Workbook** –
 - Structured daily notetaking pages for every lesson
 - Practice for every lesson
 - Guided problem solving pages for every lesson with scaffolded questions
 - Vocabulary and study skills focusing on key mathematical vocabulary
 - **All-in-One Student Workbook, Adapted Version** – Adapted for special needs students. Includes all the resources in the regular All-in-One Student Workbooks, in an adapted form.
 - **Student Center Online** – Complete interactive textbook with videos built-in at point-of-use, digital activities, stepped-out examples, vocabulary support – and more. Also includes the All-in-One Student Workbooks.
 - **Companion Websites** - Grants instant access to a wealth of resources to support learning including vocabulary quizzes, lesson quizzes, data updates, tutorials, chapter tests, and homework video tutors.
- **Transparency Package**
 - **Classroom Aid Transparencies** - Full-color multi-use transparencies such as graphs, fraction strips, and manipulatives
 - **Additional Examples on Transparencies**
 - **Daily Skills Check and Lesson Quiz Transparencies**
 - **Standards Review Transparencies**
 - **Student Edition Answers on Transparencies**

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Algebra 2	
A2.1. Core Content: Solving problems	
<p>The first core content area highlights the type of problems students will be able to solve by the end of Algebra 2, as they extend their ability to solve problems with additional functions and equations. When presented with a word problem, students are able to determine which function or equation models the problem and use that information to solve the problem. They build on what they learned in Algebra 1 about linear and quadratic functions and are able to solve more complex problems. Additionally, students learn to solve problems modeled by exponential and logarithmic functions, systems of equations and inequalities, inverse variations, and combinations and permutations. Turning word problems into equations that can be solved is a skill students hone throughout Algebra 2 and subsequent mathematics courses.</p>	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.1.A Select and justify functions and equations to model and solve problems.	SE/TE: 238-242, 22(#66), 69(#83)
A2.1.B Solve problems that can be represented by systems of equations and inequalities.	SE/TE: 125-130, 133-138, 139-144
A2.1.C Solve problems that can be represented by quadratic functions, equations, and inequalities.	SE/TE: 238-242, 289-295, 296-297, 589
A2.1.D Solve problems that can be represented by exponential and logarithmic functions and equations.	SE/TE: 430-437, 439-445, 438
A2.1.E Solve problems that can be represented by inverse variations of the forms $f(x) = a/x + b$, $f(x) = a/x^2 + b$, and $f(x) = a/(bx + c)$.	SE/TE: 488-493, 495-500, 506-507
A2.1.F Solve problems involving combinations and permutations.	SE/TE: 345-347, 361 Data Analysis and Probability Workbook: 54-61
A2.2. Core Content: Numbers, expressions, and operations (Numbers, Operations, Algebra)	
<p>Students extend their understanding of number systems to include complex numbers, which they will see as solutions for quadratic equations. They grow more proficient in their use of algebraic techniques as they continue to use variables and expressions to solve problems. As problems become more sophisticated and the level of mathematics increases, so does the complexity of the symbolic manipulations and computations necessary to solve the problems. Students refine the foundational algebraic skills they need to be successful in subsequent mathematics courses.</p>	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.2.A Explain how whole, integer, rational, real, and complex numbers are related, and identify the number system(s) within which a given algebraic equation can be solved.	SE/TE: 4-10, 274-279, 289-295
A2.2.B Use the laws of exponents to simplify and evaluate numeric and algebraic expressions that contain rational exponents.	SE/TE: 368, 369-373, 374-379, 385-390, 266
A2.2.C Add, subtract, multiply, divide, and simplify rational and more general algebraic expressions.	SE/TE: 306-311, 320-325, 509-512, 512-520

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A2.3. Core Content: <i>Quadratic functions and equations (Algebra)</i>	
As students continue to solve quadratic equations and inequalities in Algebra 2, they encounter complex roots for the first time. They learn to translate between forms of quadratic equations, applying the vertex form to evaluate maximum and minimum values and find symmetry of the graph, and they learn to identify which form should be used in a particular situation. This opens up a whole range of new problems students can solve using quadratics. These algebraic skills are applied in subsequent high school mathematics and statistics courses.	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.3.A Translate between the standard form of a quadratic function, the vertex form, and the factored form; graph and interpret the meaning of each form.	SE/TE: 238-243, 245-251, 252-258
A2.3.B Determine the number and nature of the roots of a quadratic function.	SE/TE: 252-258, 267-272, 289-295, 273
A2.3.C Solve quadratic equations and inequalities, including equations with complex roots.	SE/TE: 267-272, 282-287, 289-295, 296-297, 273, 281, 288
A2.4. Core Content: <i>Exponential and logarithmic functions and equations (Algebra)</i>	
Students extend their understanding of exponential functions from Algebra 1 with an emphasis on inverse functions. This leads to a natural introduction of logarithms and logarithmic functions. They learn to use the basic properties of exponential and logarithmic functions, graphing both types of function to analyze relationships, represent and model problems, and answer questions. Students employ these functions in many practical situations, such as applying exponential functions to determine compound interest and applying logarithmic functions to determine the pH of a liquid.	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.4.A Know and use basic properties of exponential and logarithmic functions and the inverse relationship between them.	SE/TE: 430-437, 439-445, 446-452, 454-459, 461-467, 453, 470-475
A2.4.B Graph an exponential function of the form $f(x) = ab^x$ and its inverse logarithmic function.	SE/TE: 439-445, 446-452, 461-467, 469
A2.4.C Solve exponential and logarithmic equations.	SE/TE: 439-445, 446-452, 461-467, 453, 469, 470-475, 476-477
A2.5. Core Content: <i>Additional functions and equations (Algebra)</i>	
Students learn about additional classes of functions including square root, cubic, logarithmic, and those involving inverse variation. Students plot points and sketch graphs to represent these functions and use algebraic techniques to solve related equations. In addition to studying the defining characteristics of each of these classes of functions, students gain the ability to construct new functions algebraically and using transformations. These extended skills and techniques serve as the foundation for further study and analysis of functions in subsequent mathematics courses.	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.5.A Construct new functions using the transformations $f(x - h)$, $f(x) + k$, $cf(x)$, and by adding and subtracting functions, and describe the effect on the original graph(s).	SE/TE: 93-100, 398-403

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A2.5.B Plot points, sketch, and describe the graphs of functions of the form $f(x) = a\sqrt{x} - c + d$, and solve related equations.	SE/TE: 391-396, 414-419, 397, 420-421
A2.5.C Plot points, sketch, and describe the graphs of functions of the form $f(x) = a/x + b$, $f(x) = a/x^2 + b$, and $f(x) = a/(bx + c)$, and solve related equations.	SE/TE: 488-493, 495-500, 521, 522-527, 494, 529
A2.5.D Plot points, sketch, and describe the graphs of cubic polynomial functions of the form $f(x) = ax^3 + d$ as an example of higher order polynomials and solve related equations.	SE/TE: 327-332, 306-311, 313-317, 333
Algebra 2	
A2.6. Core Content: Probability, data, and distributions (Data/Statistics/Probability)	
Students formalize their study of probability, computing both combinations and permutations to calculate the likelihood of an outcome in uncertain circumstances and applying the binomial theorem to solve problems. They extend their use of statistics to graph bivariate data and analyze its shape to make predictions. They calculate and interpret measures of variability, confidence intervals, and margins of error for population proportions. Dual goals underlie the content in the section: students prepare for the further study of statistics and become thoughtful consumers of data.	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.6.A Apply the fundamental counting principle and the ideas of order and replacement to calculate probabilities in situations arising from two-stage experiments (compound events).	SE/TE: 345-350 Data Analysis and Probability Workbook: 54-61
A2.6.B Given a finite sample space consisting of equally likely outcomes and containing events A and B, determine whether A and B are independent or dependent, and find the conditional probability of A given B.	SE/TE: 654-658, 659 Data Analysis and Probability Workbook: 62-78
A2.6.C Compute permutations and combinations, and use the results to calculate probabilities.	SE/TE: 345-350 Data Analysis and Probability Workbook: 62-78
A2.6.D Apply the binomial theorem to solve problems involving probability.	SE/TE: 685-691
A2.6.E Determine if a bivariate data set can be better modeled with an exponential or a quadratic function and use the model to make predictions.	SE/TE: 306-311
A2.6.F Calculate and interpret measures of variability and standard deviation and use these measures and the characteristics of the normal distribution to describe and compare data sets.	SE/TE: 668-674, 692-698, 699, 677-684
A2.6.G Calculate and interpret margin of error and confidence intervals for population proportions.	SE/TE: 677-684

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A2.7. Additional Key Content (<i>Algebra</i>)	
Students study two important topics here. First, they extend their ability to solve systems of two equations in two variables to solving systems of three equations in three variables, which leads to the full development of matrices in Precalculus. Second, they formalize their work with series as they learn to find the terms and partial sums of arithmetic series and the terms and partial and infinite sums of geometric series. This conceptual understanding of series lays an important foundation for understanding calculus.	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.7.A Solve systems of three equations with three variables.	SE/TE: 152-157, 206-210, 146-150
A2.7.B Find the terms and partial sums of arithmetic and geometric series and the infinite sum for geometric series.	SE/TE: 600-604, 606-610, 612-617, 619-623, 626-631, 635-639, 611, 625, 634
Algebra 2	
A2.8. Core Processes: <i>Reasoning, problem solving, and communication</i>	
Students formalize the development of reasoning at high school as they use algebra and the properties of number systems to develop valid mathematical arguments, make and prove conjectures, and find counterexamples to refute false statements using correct mathematical language, terms, and symbols in all situations. They extend the problem-solving practices developed in earlier grades and apply them to more challenging problems, including problems related to mathematical and applied situations. Students formalize a coherent problem-solving process in which they analyze the situation to determine the question(s) to be answered, synthesize given information, and identify implicit and explicit assumptions that have been made. They examine their solution(s) to determine reasonableness, accuracy, and meaning in the context of the original problem. The mathematical thinking, reasoning, and problem-solving processes students learn in high school mathematics can be used throughout their lives as they deal with a world in which an increasing amount of information is presented in quantitative ways and more and more occupations and fields of study rely on mathematics.	
Performance Expectation Explanatory Comments and Examples	
<i>Students are expected to:</i>	
A2.8.A Analyze a problem situation and represent it mathematically.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 30 (#26-28), 122 (#44), 132
A2.8.B Select and apply strategies to solve problems.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 122 (#46-48), 128 (#16), 319 (#62)
A2.8.C Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 30 (#37), 264 (#70), 395 (#34-42)
A2.8.D Generalize a solution strategy for a single problem to a class of related problems and apply a strategy for a class of related problems to solve specific problems.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 129 (#43), 318 (#58), 881-885
A2.8.E Read and interpret diagrams, graphs, and text containing the symbols, language, and conventions of mathematics.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 168-173, 244, 402 (#62)

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A2.8.F Summarize mathematical ideas with precision and efficiency for a given audience and purpose.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 358, 443 (#31), 615 (#54)
A2.8.G Use inductive reasoning and the properties of numbers to make conjectures, and use deductive reasoning to prove or disprove conjectures.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 23 (#67), 632-633
A2.8.H Synthesize information to draw conclusions and evaluate the arguments and conclusions of others.	SE/TE: This standard is addressed throughout the text. Sample citations follow: 287 (#50), 616 (#58), 630 (#44)