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Correlated to:
Washington Mathematics Standards, Algebra 2 (2008)

WASHINGTON MATHEMATICS STANDARDS, ALGEBRA 2 (2008)	ALGEBRA AND TRIGONOMETRY © 2006 (FOERSTER)
Algebra 2	
A2.1. Core Content: *Solving problems*	
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.	
Performance Expectation Explanatory Comments and Examples	
Students are expected to:	
A2.1.A Select and justify functions and equations to model and solve problems.	**SE/TE: 93-95, 204-206, 300-302, 549-550, 786-788**
A2.1.B Solve problems that can be represented by systems of equations and inequalities.	**SE/TE: 126-128, 133-137, 146-148, 153-155, 157-160**
A2.1.C Solve problems that can be represented by quadratic functions, equations, and inequalities.	**SE/TE: 181-185, 195-197, 204-207**
A2.1.D Solve problems that can be represented by exponential and logarithmic functions and equations.	**SE/TE: 260, 263-264, 290-294, 300-304**
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: 383-387, 432-436, 443**
A2.1.F Solve problems involving combinations and permutations.	**SE/TE: 642-645, 651-655, 670**
A2.2. Core Content: *Numbers, expressions, and operations (Numbers, Operations, Algebra)*	
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.	
Performance Expectation Explanatory Comments and Examples	
Students are expected to:	
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: 1-2, 4-5, 190-192, 517**
A2.2.B Use the laws of exponents to simplify and evaluate numeric and algebraic expressions that contain rational exponents.	**SE/TE: 229-230, 236-239, 241-243, 248-250**
A2.2.C Add, subtract, multiply, divide, and simplify rational and more general algebraic expressions.	**SE/TE: 343-345, 356-357, 364-368**

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A2.3. Core Content: *Quadratic functions and equations (Algebra)*	
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	
Students are expected to:	
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: 175-179, 181-184, 200-202, 204-208**
A2.3.B Determine the number and nature of the roots of a quadratic function.	**SE/TE: 181-184, 188-190, 195-198, 204-208**
A2.3.C Solve quadratic equations and inequalities, including equations with complex roots.	**SE/TE: 181-184, 188-190, 195-198, 204-208, 526-527**
A2.4. Core Content: *Exponential and logarithmic functions and equations (Algebra)*	
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	
Students are expected to:	
A2.4.A Know and use basic properties of exponential and logarithmic functions and the inverse relationship between them.	**SE/TE: 229-230, 260-261, 263-265, 288-290, 295-297,** 300-304
A2.4.B Graph an exponential function of the form $f(x) = ab^x$ and its inverse logarithmic function.	**SE/TE: 289-290, 295-297, 300-304**
A2.4.C Solve exponential and logarithmic equations.	**SE/TE: 260-261, 263-265, 269, 274-275, 300-304**
A2.5. Core Content: *Additional functions and equations (Algebra)*	
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	
Students are expected to:	
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: 53-56, 119, 443-444**

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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: 414-416, 425-429, 432-435**
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: 324-328, 370-373, 378-381, 383-388**
A2.5.D Plot points, sketch, and describe the graphs of cubic polynomial functions of the form $f(x) = ax3 + d$ as an example of higher order polynomials and solve related equations.	**SE/TE: 514-516, 530-534, 544, 549-552**
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 binominal 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	
Students are expected to:	
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: 636-638, 642-645, 651-655, 661-665**
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: 661-665, 671-673, 681-683**
A2.6.C Compute permutations and combinations, and use the results to calculate probabilities.	**SE/TE: 636-638, 642-645, 651-655**
A2.6.D Apply the binomial theorem to solve problems involving probability.	**SE/TE: 617, 619-623, 671-673**
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: 204-207, 300-305**
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: 690-691, 693-694, 696**
A2.6.G Calculate and interpret margin of error and confidence intervals for population proportions.	

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A2.7. Additional Key Content (*Algebra*)	
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	
Students are expected to:	
A2.7.A Solve systems of three equations with three variables.	**SE/TE: 138-141, 146-148**
A2.7.B Find the terms and partial sums of arithmetic and geometric series and the infinite sum for geometric series.	**SE/TE: 560-562, 564-568, 572-575, 577-579, 589-593**
Algebra 2	
A2.8. Core Processes: *Reasoning, problem solving, and communication*	
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	
Students are expected to:	
A2.8.A Analyze a problem situation and represent it mathematically.	**SE/TE: 93-95, 204-208, 300-305, 549-553, 597-603,** 756-760, 786-791
A2.8.B Select and apply strategies to solve problems.	**SE/TE: 93-95, 204-207, 300-305, 549-553, 597-603**
A2.8.C Evaluate a solution for reasonableness, verify its accuracy, and interpret the solution in the context of the original problem.	**SE/TE: 58-61, 349-351, 544-546**
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: 37-38, 328-330, 347-351**
A2.8.E Read and interpret diagrams, graphs, and text containing the symbols, language, and conventions of mathematics.	**SE/TE: 58-61, 157-161, 328-330**
A2.8.F Summarize mathematical ideas with precision and efficiency for a given audience and purpose.	**SE/TE: 37-38, 157-161, 384-386**

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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: 32-35, 37-38, 282-284, 384-386
A2.8.H Synthesize information to draw conclusions and evaluate the arguments and conclusions of others.	SE/TE: 37-38, 58-61

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