

Algebra 2 Course Outline

Algebra II Prerequisites: Students enrolled in Algebra II should have one year each of Algebra I and Geometry. Students should have a command of order of operations, solving for a variable, finding the equation of a line, solving a quadratic equation, the Pythagorean theorem, graphing, volumes, areas, and inequalities.

Algebra II: *"This discipline complements and expands the mathematical content and concepts of Algebra I and Geometry. Students who master Algebra II will gain experience with algebraic solutions of problems in various content areas, including the solution of systems of quadratic equations, logarithmic and exponential functions, the binomial theorem, and the complex number system."*
(Mathematics Framework for California Public School pg. 83)

Standard		Quarter 1	Quarter 2	Quarter 3	Quarter 4
		Textbook Sections	Textbook Sections	Textbook Sections	Textbook Sections
1.0	Students solve equations and inequalities involving absolute value.	1.3, 1.5, 1.6, 1.7 2.4, 2.5, 2.6, 2.7, 2.8			
2.0	Students solve systems of linear equations and inequalities (in two or three variables) by substitution, with graphs, or with matrices.	3.1, 3.2, 3.3, 3.4 3.5, 3.6	4.1, 4.2, 4.3, 4.4, 4.5		

3.0	Students are adept at operations on polynomials including long division.		6.2, 6.3, 6.5, 6.9		
4.0	Students factor polynomials representing difference of squares, perfect squares, trinomials, and the sum and difference of two cubes.		5.2 6.4, 6.6, 6.7		

Standard		Quarter 1	Quarter 2	Quarter 3	Quarter 4
		Textbook Sections	Textbook Sections	Textbook Sections	Textbook Sections
5.0	Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically. In particular, they can plot complex numbers as points in the plane.		5.4		
6.0	Students add, subtract, multiply, and divide		5.4		

	complex numbers.				
7.0	Students add, subtract, multiply, divide, reduce and evaluate rational expressions with monomial and polynomial denominators and simplify complicated rational expressions including those with negative exponents in the denominator.	2.2	6.1	7.2 9.1, 9.4, 9.5, 9.6	
8.0	Students solve and graph quadratic equations by factoring and completing the square or using the quadratic formula. Students apply these techniques in solving word problems. They also solve quadratic equations in the complex number system.		5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7		
9.0	Students demonstrate and explain the effect of changing a coefficient has on the graph of quadratic functions; that is, students can determine how the		5.1	7.5	

	graph of a parabola changes as A, B, and C vary in the equation $y = a(x-b)^2 + c$				
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Standard		Quarter 1	Quarter 2	Quarter 3	Quarter 4
		Textbook Sections	Textbook Section	Textbook Sections	Textbook Sections
10.0	Students graph the quadratic functions and determine the maxima, minima, and zeros of the function.		5.1, 5.2, 5.5, 5.8 6.8		
11.0	Students prove simple laws of logarithms: 11.1) Students understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents. 11.2) Students judge the validity of an argument according to whether the properties of real numbers, exponents and			7.7 8.4, 8.6	

	logarithms have been applied correctly at each step.				
12.0	Students know the laws of fractional exponents, understand exponential functions and use these functions in problems involving exponential growth and decay.		6.1	7.1, 7.2, 8.1, 8.2, 8.3, 8.7, 8.8	
13.0	Students use the definition of logarithms to translate between logarithms in any base			8.5	
14.0	Students understand and use the properties of logarithms to solve logarithmic and numeric expressions and their approximate values			8.5	

Standard		Quarter 1	Quarter 2	Quarter 3	Quarter 4
		Textbook Sections	Textbook Sections	Textbook Sections	Textbook Sections
15.0	Students determine whether a specific				

	algebraic statement involving rational expressions, radical expressions, or logarithmic or exponential functions is sometimes true, always true or never true			7.6, 7.7	
16.0	Students demonstrate and explain how the geometry of conic sections (e.g., asymptotes, foci, eccentricity) depends on the coefficients of the quadratic equation representing it		5.1	9.2, 9.3	10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7
17.0	Given a quadratic equation of the form $ax^2+by^2+cy+dy+e=0$ students can use this method for completing the square to put the equation into standard form and can recognize whether the graph of the equation is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.	2.3	5.5		
18.0	Students use fundamental counting and principles to compute the combinations and permutations			7.7	12.1, 12.2

19.0	Students use combinations and permutations to compute the probabilities				12.3, 12.4, 12.5
20.0	Students know the binomial theorem and use it to expand binomial expressions that are raised to positive integers powers				12.2

Standard		Quarter 1	Quarter 2	Quarter 3	Quarter 4
		Textbook Sections	Textbook Sections	Textbook Sections	Textbook Sections
21.0	Students apply the method of mathematical induction to prove general statements about positive integers				11.extention
22.0	Students find the general term and the sums of arithmetic series of both finite and infinite geometric series				11.1, 11.2, 11.3, 11.4, 11.5
	Students derive the				11.2,11.3,11.4

23.0	summation of formulas for arithmetic series and for both finite and infinite geometric series				
24.0	Students solve problems involving functional concepts, such as composition, defining the inverse function and performing arithmetic operations on functions	1.4 2.1		7.3, 7.4	
25.0	Students use properties from number systems to justify steps in combining and simplifying functions	1.1, 1.2			

Instructional Plan: All California Standards will be addressed through the use of the textbook (see table above for specific chapter and section in the textbook that addresses each standard). Projects developed by individual teachers will supplement the textbook and give students an opportunity to develop deeper understanding of specific concepts

Assessment:

- Daily Assignments
- Quizzes
- Chapter Tests
- Notebooks
- Projects
- Accumulative Semester Final

Textbook: McDougal Littell Algebra II by Larsen, Boswell, and Stiff copyright 2001