

**Advanced Algebra II  
(Pacing Guide) 2010-2011**

**Board Approved Curriculum:** *Advanced Algebra Through Data Exploration*

Timeline	Topics	Description	Indicators	Benchmarks	Aligned Instructional Resources	Assessments
8 days 8/19-8/30	Introduction to Functions	Formally define function with $f(x)$ notation: domain, range, vertical line test, relation, and composition of functions	1. Define function formally and with $f(x)$ notation. 2. Describe and compare characteristics of the following families of functions: square root, cubic, absolute value and basic trigonometric functions; e.g., general shape, possible number of roots, domain and range.	P.B. Identify and classify functions as linear or nonlinear and contrast their properties using tables, graphs or equations.		
17 days 8/31-9/23	Linear Functions	Solve and graph linear equations, model and solve real-world problems using linear functions: slope, slope-intercept form, standard form, $x/y$ intercepts, parallel lines, and perpendicular lines. Model and solve problems involving geometry concepts such as area and volume.	5. Solve simple linear and nonlinear equations and inequalities having square roots as coefficients and solutions. 6. Solve equations and inequalities having rational expressions as coefficients and solutions.	P.D. Using algebraic representations such as tables, graphs, expressions, functions and inequalities to model and solve problem situations.		
6 days 9/24-10/1	Linear Inequalities and Systems of Linear Inequalities	Model, graph, and solve real world problems involving linear inequalities and systems of linear inequalities	7. Solve systems of linear inequalities. 11. Solve real-world problems that can be modeled, using systems of linear equations and inequalities.	P.H. Solve systems of linear equations involving two variables graphically and symbolically.		
13 days 10/4-10/20	Systems of 2 Equations	Solve systems of 2 equations and describe the solution set: substitution, elimination, Cramer's Rule, and graphing with technology. Model and solve real world problems.	9. Solve and interpret the meaning of 2 by 2 systems of linear equations graphically, by substitution and by elimination, with and without technology.	P.H. Solve systems of linear equations involving two variables graphically and symbolically.		
2 days 10/21-10/22	Quarter Assessment					
10 days 10/25-11/5	Systems of 3 Equations	Solve systems of 3 equations and describe the solution set: substitution, elimination, and Cramer's Rule	9. Solve 3 by 3 systems of linear equations by elimination and using technology, and interpret graphically what the solution means (a point, line, plane, or no solution). 5. Set up and solve systems of equations using matrices and graphs, with and without technology.	P.D. Apply algebraic methods to represent and generalize problem situations involving vectors and matrices.		
10 days 11/8-11/19	Polynomial Operations	Add, subtract, multiply, divide monomials: add, subtract, multiply, and divide polynomials by monomials only	11. Add, subtract, multiply and divide monomials and polynomials (division of polynomials by monomials only).	P.D. Apply algebraic methods to represent and generalize problem situations involving vectors and matrices.		
15 days 11/22-12/15	Factoring	Factor Polynomials: greatest common factor, differences of squares, sum/difference of cubes, and trinomials	10. Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology.	P.G. Solving quadratic equations with real roots by graphing, formula, and factoring.		
4 days 12/16-12/21	Semester Exam					
10 days 1/5-1/19	Rational Expressions	Simplify, multiply divide, add, subtract, and find excluded (restricted) values	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior. 12. Simplify rational expressions by eliminating common factors and applying properties of integer exponents.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
14 days 1/20-2/8	Radical Expressions	Simplify real and imaginary roots: add, subtract, multiply, divide, rationalizing, and conjugates. Graph complex numbers in the complex plane.	2. Describe and compare characteristics of the following families of functions: square root, cubic, absolute value and basic trigonometric functions; e.g., general shape, possible number of roots, domain and range. 1. Connect physical, verbal and symbolic representations of irrational numbers; e.g., construct $\sqrt{2}$ as a hypotenuse or on a number line. 7. Compute sums, differences, products and quotients of complex numbers.	P.B. Identify and classify functions as linear or nonlinear and contrast their properties using tables, graphs or equations. N.D. Connect physical, verbal, and symbolic representations of integers, rational numbers and irrational numbers. N.E. Represent and compute with complex numbers.		
3 days 2/9-2/11	Rational Exponents	Simplify expressions involving rational expressions; translate between exponential form and radical form	8. Use fractional and negative exponents as optional ways of representing and finding solutions for problem situations; e.g., $27^{2/3} = (27^{1/3})^2 = 9$ .	N.C. Apply factorials and exponents, including fractional exponents, to solve practical problems.		
16 days 2/14-3/8	Solving Quadratic Equations	Solve quadratic equations with real and complex roots by factoring, completing the square, and using the quadratic formula	10. Solve quadratic equations with real roots by factoring, graphing, using the quadratic formula and with technology. 10. Solve real-world problems that can be modeled using linear, quadratic, exponential or square root functions.	P.G. Solve quadratic equations with real roots, by graphing, formula, and factoring.		

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8 days 3/9-3/18 *OGT Test 3/14-3/18	Quarter Assessment and OGT Week					
10 days 3/21-4/8	Quadratic Functions	Domain, range, vertex, vertex form, writing in vertex form by completing the square, graph, x and y intercepts, axis of symmetry, maxima, minima	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior. 4. Identify the maximum and minimum points of polynomial, rational and trigonometric functions graphically and with technology.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
4 days 4/11-4/14	Absolute Value Functions	Domain, range, vertex, graph, x and y intercepts, maxima, minima	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior. 4. Identify the maximum and minimum points of polynomial, rational and trigonometric functions graphically and with technology.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
4 days 4/15-4/20	Root Functions	Domain, range, graph, x and y intercepts, maxima, minima	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior. 4. Identify the maximum and minimum points of polynomial, rational and trigonometric functions graphically and with technology. 11. Describe how a change in the value of a constant in an exponential, logarithmic or radical equation affects the graph of the equation.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
10 days 4/25-5/6	Exponential and Logarithmic Functions	Evaluate logarithmic expressions, solve exponential and logarithmic equations by hand, domain, range, graph, x and y intercepts, asymptotes	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior. 11. Describe how a change in the value of a constant in an exponential, logarithmic or radical equation affects the graph of the equation.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
3 days 5/9-5/11	Inverse Functions	Find inverse functions for linear, quadratic, logarithmic, and exponential functions. Determine if two functions are inverses. Examine the graphs of inverse functions.	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
2 days 5/12-5/13	Greatest Integer Functions	Graph, domain, range	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
3 days 5/16-5/18	Piecewise Functions	Graph piecewise functions made up of the functions above by hand and using technology.	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		

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2 days 5/19 5/20	Polynomial Functions of Degree 3 or more	Use technology to model and solve real-world problem situations involving polynomial functions of degree 3 or more.	3. Describe and compare the characteristics of the following families of functions: quadratics with complex roots, polynomials of any degree, logarithms, and rational functions; e.g., general shape, number of roots, domain and range, asymptotic behavior.	P.A. Analyzing functions by investigating rate of change, intercepts, zeros, asymptotes, and local and global behavior.		
4 days 5/23-5/26	Semester Exam					