**Algebra II Pacing Guide**

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| **SOL** | **Topic** |  |
| 1.4 | Place the following sets of numbers in a hierarchy of subsets: complex, pure imaginary, real, rational, irrational, integers, whole and natural. |  |
| 17.1 | Recognize that the square root of -1 is represented by i. |  |
| 17.2 | Define and identify a complex number. |  |
| 17.4 | Simplify powers of *i.* |  |
| 1.1 | Identify examples of field properties: commutative, associative, identity, inverse, and distributive. |  |
| 1.2 | Identify examples of axioms of equality: reflexive, symmetric, transitive, substitution, addition, and multiplication. |  |
| 1.3 | Identify examples of axioms of inequality and order trichotomy, transitive, addition and multiplication. |  |
| 9.1 | Identify the domain and range of a function presented algebraically and graphically. |  |
| 9.2 | Distinguish between relations and functions that are expressed algebraically and graphically. |  |
| 9.7 | Find the value of a function for a given element from the domain. |  |
|  | Algebra of Functions: +, -, \*, /, Composition. |  |
| 9.3 | Recognize restricted/ discontinuous domains and ranges. |  |
| 9.6 | Find the composition of two functions. |  |
| 9.1 | Identify the inverse of a function presented algebraically or graphically. |  |
| 9.4 | Use interchange of variables to find the inverse of a function. |  |
| 9.1 | Identify the zeros of a function presented algebraically. |  |
| 10.1 | Identify the x-intercept of a linear graph. |  |
| 10.2 | Identify the zero of a linear f(x) given its graph. |  |
| Review | Solve multistep equations in one variable. |  |
| 4.1 | Solve absolute value equations in one variable algebraically & graphically. |  |
| 4.3 | Express solutions to absolute value equations in one variable graphically. |  |
| Review | Solve compound inequalities. |  |
| 4.2 | Solve absolute value inequalities in one variable algebraically and graphically. |  |
| 4.3 | Express solutions to absolute value inequalities in one variable graphically and as an algebraic inequality. |  |
| 19.1 | Collect and analyze data. |  |
| 19.2 | Investigate scatterplots. |  |
| 19.3 | Find an equation for the curve of best fit for data using a graphing calculator. Models will include linear, quadratic, exponential and logarithmic functions. |  |
| 19.4 | Make predictions using data, scatterplots or curve of best fit. |  |
| Review | Matrix vocabulary: Dimension, Scalar |  |
| 11.1 | Recognize matrices that can be multiplied. |  |
| 1.5 | Add and multiply matrices and determine which field properties hold true. |  |
| 11.2 | Perform matrix multiplication w/ calculator or computer program. |  |
| 11.3 | Use matrix multiplication to solve practical problems. |  |
| Review | Solving systems of linear equations by graphing, substitution, and elimination. |  |
| Review | Solve systems of linear equations in 3 variables by elimination. |  |
| 12.4 | Find the inverse of a matrix with graphing calculator. |  |
|  | Find the identity matrix for any square matrix. |  |
| 12.2 | Represent a system of no more than 3 linear equations in matrix form. |  |
| 12.5 | Express a system of linear equations as a matrix equation. |  |
| 12.3 | Solve a matrix equation using a graphing calculator or computer program with matrix capability. |  |
|  | Determinants, Cramer’s Rule |  |
| 12.1 | Model problems with a system of no more than three linear equations. |  |
| 4.5 | Verify solutions to absolute value equations and inequalities in 2 variables using a calculator. |  |
| 4.4 | Graph absolute value equations and inequalities in 2 variables. |  |
| 13.2 | Solve systems of linear inequalities. |  |
| 13.3 | Identify the feasibility region of a system of linear inequalities with no more than 5 constraints. |  |
| 13.4 | Identify the coordinates of the corner points of a feasibility region. |  |
| 13.5 | Find the maximum or minimum value for the function defined over the feasibility region. |  |
| 13.6 | Describe the meaning of the maximum or minimum value. |  |
| 13.1 | Model practical problems with systems of linear inequalities. |  |

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|  | **Algebra II Pacing Guide**  Second Nine Weeks |  |  |
| **SOL** | **Topic** | **Blocks** |  |
| 3.2 | Convert from radical notation to exponential notation and vice versa |  |  |
| Review | Properties of exponents. | 1 |  |
| 17.3 | Apply the definition of *i* to simplify square roots of negative numbers. |  |  |
| Review | Simplifying radicals |  |  |
| 3.1 | Simplify radical expressions containing positive rational numbers and variables. | 1 |  |
| 3.4 | Multiply and divide radical expressions not requiring rationalizing the denominator. | 1 |  |
|  | Multiply and divide radical expressions requiring rationalizing the denominator. | 1 |  |
| Review | Operations with polynomials |  |  |
| 17.5 | Add, subtract, multiply complex numbers. |  |  |
| 3.3 | Add and subtract radical expressions with like radicands. | 1 |  |
|  | Add and subtract radical expressions with radicands requiring simplification. |  |  |
| 5.1 | Determine the greatest monomial factor as a first step in complete factorization. |  |  |
| 5.2 | Recognize squares and cubes of positive integers. | 4 |  |
| 5.4 | Factor polynomials by applying general patterns. |  |  |
| 5.3 | Recognize examples of general patterns: difference of squares, sum & difference of cubes, perfect square trinomials. |  |  |
| 6.1 | Recognize a quadratic equation |  |  |
| 6.2a | Select an appropriate strategy for solving a quadratic equation: factoring. | 2 |  |
| 6.2b | Select an appropriate strategy for solving a quadratic equation:  Completing the square and graphing. |  |  |
| 6.3 | Solve a quadratic equation over the set of complex numbers. | 2 |  |
|  | Discuss the discriminant and the nature of the roots. |  |  |
| 6.4 | Identify from a graph the real solutions to a quadratic equation. |  |  |
| 6.5 | Find the real roots of a quadratic equation using a graphing calculator. | 1 |  |
| 10.1 | Identify the x-intercepts of a quadratic graph. |  |  |
| 10.2 | Identify the zeros of a quadratic function, given a graph. | 1 |  |
| 10.3 | Determine the linear factors of a quadratic expression when the zeros of the corresponding quadratic function are displayed on a graph. |  |  |

**Algebra II Pacing Guide**

Third Nine Weeks

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| **SOL** | **Topic** |  |
|  | Polynomial long division |  |
|  | Synthetic division |  |
| 15.1 | Investigate the shape and behavior of linear, quadratic and cubic functions. Behaviors will include intercepts, number of turning points and end behavior. |  |
|  | Descartes Rule of signs, Depressing the equation, rational root theorem. |  |
| 10.1 | Identify the x-intercepts of a graph. |  |
| 10.2 | Identify the zeros of a function, given a graph. |  |
| 10.3 | Determine the linear factors of a polynomial expression when the zeros of the corresponding polynomial function are displayed on a graph. |  |
| 15.3 | Using the general shape of a function, identify the odd or even family of graphs to which a particular graph belongs. Characteristics of a graph may include the intercepts, number and location of turning points and end behavior. |  |
| 8.1 | Recognize the graphs of parent functions for linear, quadratic, absolute value, step and exponential functions. |  |
| 8.4 | Given an equation, graph a linear, quadratic, absolute value, step or exponential function with the aid of a calculator. |  |
| 8.2 | Given an equation of a function, identify the function as linear, quadratic, absolute value, step or exponential. |  |
| 8.3 | Write the equation of a linear, quadratic, absolute value, step or exponential function, given the graph of a parent function or an integral translation. |  |
| 15.2 | Investigate the shape and behavior of exponential and  logarithmic functions, including intercepts and end behavior. |  |
| 9.8 | Investigate exponential and logarithmetic functions, using the graphing calculators. |  |
| 9.5 | Given the graph, recognize that exponential and logarithmic functions are inverses of each other. |  |
| 19.1 | Collect and analyze data. |  |
| 19.2 | Investigate scatterplots (nonlinear) to determine if patterns exist and then identify patterns. |  |
| 19.3 | Find an equation for the curve of best fit for data, using a graphing calculator. Models will include quadratic, exponential and logarithmic functions. |  |
| 19.4 | Make predictions using data, scatterplots or curve of best fit. |  |
| 19.5 | Given a set of data, determine the model that would best describe the data. |  |
| 20.1 | Translate “y is directly proportional to x” as y=kx. |  |
| 20.2 | Translate “y is inversely proportional to x” as y=k/x. |  |
| 20.3 | Translate “y varies x” as y=kxz. |  |
| 20.4 | Determine the value of the constant of proportionality, k, given initial conditions for x & y. |  |
| 20.5 | Set up and solve practical problems, using combinations of direct and inverse variation. |  |
| 16.2 | Recognize patterns in a sequence. |  |
| 16.4 | Use and interpret the notations: n, nth term,  and a-sub-n. |  |
| 16.3 | Distinguish between arithmetic and geometric sequences. |  |
| 16.5 | Write the first n-terms in an arithmetic or geometric sequence. |  |
| 16.6 | Given the formula, find a-sub-n for an arithmetic or geometric sequence. |  |
| 16.1 | Distinguish between a sequence and a series. |  |
| 16.7 | Given the formulas, find the sum, S-sub-n of the first n terms of an arithmetic or geometric series include infinite series. |  |
| 16.4 | Use and interpret the sigma notation. |  |  |

**Algebra II Pacing Guide**

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| **SOL** | **Topic** |  |
| 7.2 | Solve equations containing a radical expressions algebraically and graphically. The equation will contain a linear expression under the radical and all terms outside the radical will be constants. |  |
| 7.3 | Identify from a graph the solutions to an equation containing radical expressions. |  |
| 7.4 | Solve an equation containing radical expressions using a graphic calculator. |  |
| 7.5 | Check possible solutions to an equation containing radical expressions using graphing calculator. |  |
| 2.2 | Simplify a rational expression with common monomial or binomial factors. |  |
| .- | Add, subtract, multiply and divide rational expressions whose denominators are monomials or polynomial expressions in completely factored form. |  |
| 2.3 | Recognize a complex fraction and simplify it as a quotient or product of simple fractions. |  |
| 7.3 | Identify, from a graph, the solutions to an equation containing rational expressions. |  |
| 7.5 | Check possible solutions to an equation containing rational expressions using graphing calculator. |  |
| 7.1 | Solve equations containing rational expressions with monomial denominators algebraically and graphically. |  |
| 7.4 | Solve an equation containing rational expressions using a graphing calculator. |  |
| 14.1 | Identify nonlinear systems of equations as linear-quadratic or quadratic-quadratic. |  |
| 14.2 | Visualize a nonlinear system of two equations, and predict the number of solutions, using the graphing calculator. |  |
| 14.3 | Solve a linear-quadratic system of equations algebraically and graphically. |  |
| 14.4 | Solve a quadratic-quadratic system of two equations algebraically and graphically. |  |
| 18.2 | Identify types of conic sections from a graph. |  |
| 18.1 | Identify types of conic sections, given (h,k) form of an equation. |  |
| 18.3 | Sketch the graph of a conic section in (h,k) form, using knowledge of transformations. |  |
|  | Given the graph of a conic section, write the equation. |  |