

Richmond Public Schools
Curriculum Framework
Algebra II

Strand: Equations and Inequalities	
All.4 The student will solve systems of linear-quadratic and quadratic-quadratic equations, algebraically and graphically.	
Suggested Pacing	
3 Class Periods	
Spiraling Standards	
A.4-The student will solve d) systems of two linear equations in two variables algebraically and graphically; and e) practical problems involving equations and systems of equations. A.5-The student will c) solve practical problems involving inequalities; and d) represent the solution to a system of inequalities graphically.	AFDA.5-The student will determine optimal values in problem situations by identifying constraints and using linear programming techniques. MA.11-The student will use matrices to organize data and will add and subtract matrices, multiply matrices, multiply matrices by a scalar, and use matrices to solve systems of equations.
Essential Questions	Common Misconceptions
What is a linear function? In what form(s) can it be written? What is a quadratic function? In what form(s) can it be written? How does a graphing calculator confirm algebraic solutions of quadratic functions? What are the different ways that the graph of a line and a quadratic can intersect? What are the different ways that the graphs of two quadratics can intersect?	Students may miss steps in solving nonlinear systems algebraically. Students may not identify all solutions when given a graph.
Understanding the Standard	Essential Knowledge and Skills

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<ul style="list-style-type: none"> • Quadratic equations included in this standard will only include those that can be represented as parabolas of the form $y = ax^2 + bx + c$ where $a \neq 0$. • Solutions of a system of equations are numerical values that satisfy every equation in the system. • A linear-quadratic system of equations may have zero, one, or two solutions. • A quadratic-quadratic system of equations may have zero, one, two, or an infinite number of solutions. • The coordinates of points of intersection in any system of equations are solutions to the system. • Practical problems can be interpreted, represented, and solved using systems of equations. 	<p>The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to</p> <ul style="list-style-type: none"> • Determine the number of solutions to a linear-quadratic and quadratic-quadratic system of equations in two variables. • Solve a linear-quadratic system of two equations in two variables algebraically and graphically. • Solve a quadratic-quadratic system of two equations in two variables algebraically and graphically. • Solve systems of equations and verify solutions of systems of equations with a graphing utility.
Vocabulary	Instructional Activities Organized by Learning Objective
<p>system of equations, linear system of equations, nonlinear system of equations, quadratic, solutions, coordinates, intersection, coordinates, ordered pair, coordinate plane, x-axis, y-axis, points, parabola</p>	<p>Textbook</p> <p>Eureka Math Algebra 2 Module 1 Topic C Lesson 31 Algebra 2, ©2012, Price, et al, McGraw-Hill page(s) 662-667</p>
Assessment	
<p>Common Assessment AII.4</p>	<p>Notes</p> <p>Solving Systems of Nonlinear Equations (Brainfuse) Solving System of Nonlinear Equations (Purplemath)</p> <p>Resources</p> <ul style="list-style-type: none"> • Print <p>Coach book, Virginia edition, lesson 16 of chapter 2 Coach book Algebra 2, Virginia edition, Lesson(s) 18-20 page(s) 169-212, 228-236</p>

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	<p>VDOE Lesson Plan AII.4</p> <ul style="list-style-type: none"> • Technology-based Linear and Quadratic Systems (Khan Academy) Solving Nonlinear Systems of Equations (Smartboard Exchange) <p>Station Activities</p> <p>Possible Number of Points of Intersection (VDOE Lesson Plan)</p>
Cross-Curricular Connections	Tiered Differentiations
<p>Technology-Nonlinear systems are used by cell phones and other devices to receive signals from GPS satellites.</p>	<p>Tier 1-Students will find solutions of nonlinear systems of equations algebraically Tier 2-Students will find solutions of nonlinear systems of equations algebraically and graphically. Tier 3-Students will be given graphs to aid in finding solutions to nonlinear systems of equations.</p>