

## Mathematics

Unit/Timeframe: Algebra IB - Solving Quadratic Equations / 7 weeks	Grade Level: 9, 10, 11, 12
Content Standards	2017 MA Literacy Framework
<p>N.RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p> <p>A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it</p> <p>A.SSE.B.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p>A.SSE.B.3.A Factor a quadratic expression to reveal the zeros of the function it defines.</p> <p>A.SSE.B.3.B Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</p> <p>A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. ( Include equations arising from linear, quadratic, and exponential functions with integer exponents)</p> <p>A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p> <p>A.REI.B.4 Solve quadratic equations in one variable</p> <p>A.REI.B.4.A Use the method of completing the square to transform any quadratic equation in <math>x</math> into an equation of the form <math>(x-p)^2 = q</math> that has the same solutions.</p> <p>A.REI.B.4.B Solve quadratic equations by inspection (e.g., for <math>x^2 = 49</math>), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the solutions of a quadratic equation results in non-real solutions and write them as <math>a+ bi</math> for real numbers <math>a</math> and <math>b</math>.</p> <p>A.REI.C.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.</p> <p>A.REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve( which could be a straight line)</p> <p>A.REI.D.11 Explain why the <math>x</math>-coordinates of the points where the graphs of the equations <math>y = f(x)</math> and <math>y = g(x)</math> intersect are the solutions of the equation <math>f(x)=g(x)</math>; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where <math>f(x)</math> and/or <math>g(x)</math> are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</p>	<p>Speaking and Listening Standard: Comprehension and Collaboration</p> <p>2. Reason abstractly and quantitatively</p> <p>3. Construct viable arguments and respond to the reasoning of others.</p> <p>Writing Standard: Text, type and purposes</p> <p>1C. Use words, phrases and clauses with precision.</p>

<p>F.IF.C.7.C Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior</p> <p>F.IF.C.8.A Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context</p>		
<b>Essential Questions</b>		<b>Skills/Knowledge</b>
<p>How do you use quadratic equations to model situations and solve problems?</p>		<p>Extend the properties of exponents to rational exponents.</p> <p>Interpret the structure of expressions.</p> <p>Write expressions in equivalent forms to solve problems.</p> <p>Perform arithmetic operations on polynomials.</p> <p>Understand the relationship between zeros and factors of polynomials.</p> <p>Create equations that describe numbers or relationships.</p> <p>Solve equations and inequalities in one variable.</p> <p>Solve systems of equations.</p> <p>Represent and solve equations and inequalities graphically.</p> <p>Interpret functions that arise in applications in terms of the context.</p> <p>Analyze functions using different representations.</p>
<b>Common Resources</b>		<b>Common Assessments</b>
<p>Algebra 1 text and available resources</p>		<p>Two quizzes on the various methods of solving quadratics</p> <p>Chapter Test</p>
<b>Vocabulary</b>		
<p>Tier II: completing the square, discriminant, linear-quadratic system, product property of square roots, quadratic equation, quadratic formula, root, standard form of a quadratic equation      Zero-Product Property, zeros of a function</p> <p>Tier III:</p>		
<b>Additional Notes</b>		