

## SECONDARY MATHEMATICS 2

<b>Priority Standards #1: Solve Algebraic Equations (linear and exponential and quadratic)</b>	
<b>0</b>	<i>No Evidence</i>
<b>1</b>	<ul style="list-style-type: none"> <li>Identify parts of exponential expressions (base, exponent) and define their meanings.</li> <li>Identify a complex number.</li> <li>Accurately identify the solutions of a simple inequality.</li> <li>Discriminate between radical and exponential form.</li> <li>Recognize the correct factors of a simple quadratic equation with help.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>Rewrite expressions using structure to identify important components of the expression (for example, to determine where zeros may occur or to identify the end behavior).</li> <li>Solve a quadratic equation when given the quadratic formula.</li> <li>Use one law of exponents to simplify expressions.</li> <li>Use technology to solve a simple system of equations involving a linear equation and a quadratic equation.</li> <li>Identify when a quadratic equation has complex solutions.</li> <li>Solve a linear inequality.</li> <li>Translate between radical and exponential forms with help.</li> <li>Factor a quadratic equation with a leading coefficient of 1.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>Translate fluently between radical and exponential forms using properties of exponents.</li> <li>Solve quadratic equations using quadratic formula, completing the square and factoring.</li> <li>Use multiple laws of exponents to simplify expressions.</li> <li>Solve a simple system of equations involving a linear and quadratic equation algebraically and graphically.</li> <li>Given multiple functions, simplify composite functions.</li> <li>Solve for complex solution for a quadratic equation.</li> <li>Interpret the meaning of the solution of a linear inequality.</li> <li>Factor a quadratic equation with a prime leading coefficient.</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>Given a quadratic equation, determine the most efficient way to solve.</li> <li>Explain the meaning of complex solutions to a quadratic equation.</li> <li>Apply solutions to linear inequalities to real life situations.</li> <li>Apply the laws of exponents to rational exponents.</li> <li>Factor an expression using multi-steps of factoring. (non-prime leading coefficient)</li> </ul>



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<b>Priority Standards #2: Understand, Compare and Represent Functions</b>	
<b>0</b>	<i>No Evidence</i>
<b>1</b>	<ul style="list-style-type: none"> <li>Identify an independent and a dependent variable given a relationship or word problem with help.</li> <li>Given an equation of a linear, exponential or quadratic function, graph with technology.</li> <li>Understand that the possible x values are also the independent variable and domain of a function. Likewise understand that the possible y values are the dependent variable and the range of the function.</li> <li>Given a graph, identify the type of function – linear, quadratic or exponential.</li> <li>Given a graph, identify increasing and decreasing parts of the function.</li> <li>Identify the different forms of quadratic functions.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>Identify an independent and a dependent variable given a relationship or word problem.</li> <li>Given a graphical representation, identify the domain and range.</li> <li>Given basic vertex form or factored form, graph the function with roots or vertex labeled.</li> <li>Given a graphical representation of a quadratic, identify the part of the graph that increases and the part that decreases.</li> <li>Given an equation of a linear, exponential, or quadratic function, graph with technology, show some of the key features (intercepts, end behavior, maxima, and/or minima).</li> <li>Given factors of a quadratic, find the intercepts, extreme values and the axis of symmetry.</li> <li>Identify the advantages of the different forms of quadratic functions.</li> <li>Graph a quadratic with horizontal and vertical shift.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>Given a real-world example, write an equation to represent the situation. (vertical motion model and maximizing area)</li> <li>Given an equation, identify the interval of increase and decrease for a quadratic with technology.</li> <li>Given basic vertex form, factored form or standard form, graph the function with 5 distinct points.</li> <li>Relate the domain in context, explaining restrictions as a result of the context.</li> <li>Given an equation of a linear, exponential, or quadratic function, graph with or without technology, and show ALL key features (intercepts, end behavior, maxima, and/or minima).</li> <li>Graph and find key features of piecewise-defined functions, including absolute value functions.</li> <li>Graph absolute value functions and absolute value inequalities.</li> <li>Factor quadratics to find intercepts, extreme values, and symmetry of the graph.</li> <li>Transition between different forms of quadratic functions and identify the advantages of each.</li> <li>Graph a quadratic with vertical stretch and horizontal and vertical shift.</li> <li>Given a quadratic in factored form, give a detailed graph using 5 exact points.</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>Given a real-world example, write an equation to represent the situation, solve and interpret the meaning of the solution.</li> <li>Understand that quadratic formula is equivalent to solving for x after completing the square.</li> <li>Given an absolute function, write it as a piece-wise function and graph it.</li> <li>Given a real-world situation, write a piece-wise function.</li> <li>Given any form of a quadratic, convert to all other forms of a quadratic without technology.</li> <li>Convert between all forms of a quadratic and identify the advantages of each.</li> <li>Factor quadratics with composite leading coefficients.</li> <li>Write the equations for absolute value, quadratic and exponential functions as piecewise functions with restrictions.</li> </ul>

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Priority Standards #3: Describe Characteristics of Functions	
<b>0</b>	<i>No Evidence</i>
<b>1</b>	<ul style="list-style-type: none"> <li>Given a graph, identify the function as linear, quadratic or exponential.</li> <li>Given a quadratic graph, identify the x-intercepts and y-intercepts and the vertex.</li> <li>Given the formula for calculating rate of change, can calculate the average rate of change of a linear function.</li> <li>Identify the domain of a function.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>Given an equation, identify the function as linear, quadratic or exponential.</li> <li>Given a graph, identify key features - x and y intercepts, maximum and minimum, axis of symmetry.</li> <li>Given the formula for calculating rate of change, calculate the average rate of change of a quadratic function over a given interval.</li> <li>Find the intersection of two functions using technology. Include linear, absolute value, quadratic functions.</li> <li>Identify the domain and range given a graph of a function.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>Given a table of values determine if it represents a linear, quadratic or exponential function.</li> <li>Given a quadratic equation, identify key features – x and y intercepts, maximum and minimum, axis of symmetry with technology.</li> <li>Identify domain and range of a function from any representation in interval form. Focus on quadratic functions; compare with linear and exponential functions.</li> <li>Compare average rate of change over different intervals for a single quadratic or exponential function.</li> <li>Find the intersection of two functions using technology, a table of values or algebraic strategies. Include linear, quadratic, absolute value functions.</li> <li>Use special right triangles to find missing side lengths through similar figures. (30-60-90; 45-45-90)</li> <li>Identify intervals that are increasing and decreasing in interval notation or inequality notation.</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>Given a quadratic equation, determine the most efficient way to solve and justify the chosen strategy.</li> <li>Given multiple functions with multiple intervals, determine the one with the greatest average rate of change for quadratic functions.</li> </ul>



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Priority Standards #4: Prove Congruence and Similarity in terms of Geometric Transformations	
0	No Evidence
1	<ul style="list-style-type: none"> <li>Recognize similar and congruent figures.</li> <li>Find scale factor given the lengths of side for image or pre-image.</li> <li>Identify the need for trigonometric functions. Given the relationships for special right triangles, use similarity and ratios to solve for missing sides with help.</li> <li>Given a quadrilateral, identify additional classifications for the figure. (Rectangle, square, rhombus, etc.)</li> </ul>
2	<ul style="list-style-type: none"> <li>Identify the information needed to show triangles are similar or congruent.</li> <li>Find the scale factor given the origin as the center of dilation and 2 corresponding coordinates.</li> <li>Identify the ratios for sine, cosine and tangent. (SOH-CAH-TOA)</li> <li>Given the relationships for special right triangles, use similarity and ratios to solve for missing sides.</li> <li>Recognize properties of quadrilaterals with help.</li> <li>Know precise definitions of angle, circle, perpendicular line, parallel line and line segment.</li> <li>Set up a trigonometric ratio to find missing side lengths.</li> </ul>
3	<ul style="list-style-type: none"> <li>Use similarity theorems to show triangles are similar (sides are proportional and corresponding angles are congruent)</li> <li>Given the scale factor and the origin as the center of dilation, find the corresponding coordinates of the new image.</li> <li>Recognize the length of the resulting image is proportional to the length of the original segment based on the scale factor.</li> <li>Identify properties of quadrilaterals.</li> <li>Set up and solve basic trigonometric ratio problems to find the missing sides including shadow problems, mirrors, and indirect measurement.</li> <li>Recognize that corresponding sides of the image and pre-image in a dilation will be parallel.</li> <li>Use trigonometry to solve for all missing parts of a right-triangle. (Can use Pythagorean theorem at towards the end.)</li> <li>Given a trig ratio, find all other trig ratios.</li> <li>Prove theorems about triangles. (Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.)</li> <li>Classify quadrilaterals with given information (ie opposites sides // and congruent).</li> <li>Solve problems in context involving sides or angles of congruent or similar triangles.</li> </ul>
4	<ul style="list-style-type: none"> <li>Write a formal proof to show triangles are congruent.</li> <li>Prove theorems of quadrilateral through congruent triangles.</li> <li>Use Corresponding Parts of Congruent Triangles.</li> <li>Use properties of similarity to solve shadow problems, mirrors, and indirect measurement.</li> </ul>



- Given story problems, i.e. angles of elevation and depression, use trigonometry to set up and solve for missing sides and angles.
- Prove a given quadrilateral is a specific type (i.e. rhombus, rect. etc.) using CPCTC
- Use reciprocal trigonometric relationships to give ratios of side lengths from a right triangle.

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<b>Priority Standards #5: Mathematical Modeling</b>	
<b>0</b>	<i>No Evidence</i>
<b>1</b>	<ul style="list-style-type: none"> <li>• Sketch a graph to represent a real-world situation.</li> <li>• Recognize a real-world situation as being best represented by a linear, quadratic, or exponential function.</li> <li>• Determine the rate of change in a real-world situation with help.</li> <li>• Given the distance formula and the midpoint formula, use the formulas to determine the distance and midpoint between two points.</li> </ul>
<b>2</b>	<ul style="list-style-type: none"> <li>• Recognize the variables involved in a real-world situation.</li> <li>• Determine the rate of change in a real-world situation.</li> <li>• Given a table of values, graph the resulting function.</li> <li>• Use distance formula and midpoint formula given two points.</li> <li>• Apply the distance formula and midpoint formulas, given two points.</li> </ul>
<b>3</b>	<ul style="list-style-type: none"> <li>• Produce an equation to represent a real-world quadratic situation. (ie. vertical motion models)</li> <li>• Interpret the meaning of zeros in context of a real-world situation.</li> <li>• Interpret the maximum or minimum in context of real-world situation.</li> <li>• Interpret the rate of change in context of the situation.</li> <li>• Explain restrictions as a result of the context of the problem.</li> <li>• Apply the distance formula and midpoint formula, given the graph or context.</li> </ul>
<b>4</b>	<ul style="list-style-type: none"> <li>• Given a real-world situation and an equation, explain the effect in context of changing various numbers in the equation.</li> <li>• Use a real-world graph to make predictions and analyze key points in context.</li> <li>• Given a real-world situation, draw a diagram, write and solve a trigonometric equation.</li> </ul>

