

**Mathematics  
Pre-Calculus A**

**Unit 2: Systems of Linear Equations and Inequalities**

<p><b>Essential Understandings</b></p>	<ul style="list-style-type: none"> <li>▪ Mathematics can be used to model real-life situations.</li> </ul>
<p><b>Essential Questions</b></p>	<ul style="list-style-type: none"> <li>▪ What are the properties of Algebra and how are these used to solve linear systems?</li> <li>▪ What types of data are modeled by linear systems?</li> <li>▪ How do you solve a system of linear equations?</li> <li>▪ How do you solve and graph linear inequalities?</li> </ul>
<p><b>Essential Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ The solution to a linear system is the point of intersection of the lines.</li> <li>▪ Linear systems can be solved by graphing.</li> <li>▪ Linear systems can be solved by substitution.</li> <li>▪ Linear systems can be solved by linear combinations.</li> <li>▪ Linear system can be solved using matrix algebra.</li> <li>▪ Systems may have no solution or infinitely many solutions.</li> </ul>
<p><b>Vocabulary</b></p>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ linear system of equations, point of intersection, ordered pairs, substitution, elimination, independent, dependent and inconsistent system, linear programming, linear system of inequalities</li> </ul> </li> </ul>
<p><b>Essential Skills</b></p>	<ul style="list-style-type: none"> <li>▪ Graph linear equations.</li> <li>▪ Use Algebraic properties and the substitution principle.</li> <li>▪ Use the technique of linear combinations.</li> <li>▪ Solve a system of linear equations.</li> <li>▪ Graph systems of linear inequalities and determine the feasible region.</li> </ul>
<p><b>Related Maine Learning Results</b></p>	<p><u>Mathematics</u> D. Algebra Equations and Inequalities D2.Students solve families of equations and inequalities.</p> <ol style="list-style-type: none"> <li>a. Solve systems of linear equations and inequalities in two unknowns and interpret their graphs.</li> <li>b. Solve quadratic equations graphically, by factoring in cases where factoring is efficient, and by applying the quadratic formula.</li> <li>c. Solve simple rational equations.</li> <li>d. Solve absolute value equations and inequalities and interpret the results.</li> <li>e. Apply the understanding that the solution(s) to equations of the form <math>f(x) = g(x)</math> are x-value(s) of the point(s) of intersection of the graphs of <math>f(x)</math> and <math>g(x)</math> and common outputs in table of values.</li> <li>f. Explain why the coordinates of the point of intersection of</li> </ol>

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	the lines represented by a system of equations is its solution and apply this understanding to solving problems.
<b>Related Maine Learning Results</b>	<p>Functions and Relations</p> <p>D4. Students understand and interpret the characteristics of functions using graphs, tables, and algebraic techniques.</p> <ol style="list-style-type: none"> <li>a. Recognize the graphs and sketch graphs of the basic functions.</li> <li>b. Apply functions from these families to problem situations.</li> <li>c. Use concepts such as domain, range, zeros, intercepts, and maximum and minimum values.</li> <li>d. Use the concepts of average rate of change (table of values) and increasing and decreasing over intervals, and use these characteristics to compare functions.</li> </ol>
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"> <li>▪ Solve systems of linear equations using a variety of techniques. These include graphing, substitution, and linear combinations.</li> <li>▪ Solve linear programming problems by finding a maximum or minimum value of a function that satisfies a given set of condition known as constraints.</li> </ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"> <li>▪ Evaluate homework</li> <li>Quizzes.</li> <li>▪ Chapter test</li> </ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"> <li>▪ <u>Publications:</u> <ul style="list-style-type: none"> <li>○ <u>Advanced Mathematical Concepts</u> - Glencoe</li> </ul> </li> <li>▪ <u>Other Resources:</u> <ul style="list-style-type: none"> <li>○ Graphing calculators</li> <li>○ The A+ learning system for remediation</li> </ul> </li> </ul>