

**Mathematics**  
**Pre-Calculus A**  
**Unit 3: Conic Sections**

<b>Essential Understandings</b>	<ul style="list-style-type: none"> <li>▪ Mathematics can be used to model real-life situations.</li> </ul>
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>▪ What are conic sections?</li> <li>▪ What characteristics of the equation determine the type of conic section?</li> <li>▪ How do you manipulate the general equation of a conic section into standard form?</li> <li>▪ How do you draw reasonable graphs of conic sections?</li> </ul>
<b>Essential Knowledge</b>	<ul style="list-style-type: none"> <li>▪ Algebraic manipulation is used to put the equation in standard form.</li> <li>▪ The role of coefficients of quadratic terms determines the type of conic section.</li> <li>▪ The key parts necessary to successfully graph the conic section are the geometric components such as foci, asymptotes, etc.</li> </ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ conic section, circle, ellipse, parabola, hyperbola, major axis, minor axis, vertices, foci, center, transverse axis, conjugate axis, asymptote</li> </ul> </li> </ul>
<b>Essential Skills</b>	<ul style="list-style-type: none"> <li>▪ Complete the square. Sketch graphs of conic sections.</li> <li>▪ Identify the type of conic section.</li> <li>▪ Given specific information, generate the equation of the conic section.</li> <li>▪ Identify the key parts necessary to successfully graph the conic section.</li> </ul>
<b>Related Maine Learning Results</b>	<p><u>Mathematics</u>  C. Geometry  Geometric Figures  C2.Students justify statements about circles and solve problems.</p> <ol style="list-style-type: none"> <li>a. Use the concepts of central and inscribed angles to solve problems and justify statements.</li> <li>b. Use relationships among arc length and circumference, and areas of circles and sectors to solve problems and justify statements.</li> </ol> <p>Geometric Measurement  C4.Students find the surface area and volume of three-dimensional objects.</p> <ol style="list-style-type: none"> <li>a. Find the volume and surface area of three-dimensional figures including cones and spheres.</li> <li>b. Determine the effect of changes in linear dimensions on the volume and surface areas of similar and other three-dimensional figures.</li> </ol>

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<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"> <li>▪ Graph various conic sections.</li> <li>▪ Manipulate the equation of a conic section by completing the square to put it in standard form.</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></li> </ul> </li> <li>▪ <u>Other Resources:</u> <ul style="list-style-type: none"> <li>○ Graphing calculator</li> <li>○ A+ learning system for remediation</li> </ul> </li> </ul>