Planned Course: Calculus I **Unit: Cartesian Plane & Functions** **Estimated Time: 12 days**	**Course Number: M311** **Grade Level: 11-12** **Level/Track:**	**Department: Mathematics** **Date Approved: 7/15/08**	
PA Academic Standards	**Core Concepts (in question format)** • **Skills/Knowledge**	**Activities/Strategies/Study Skills (identify some activities as remedial or enrichment activities)**	**Assessments (include types and topics)**
2.1.11 Numbers, Number Systems and Number Relationships A. Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	▶ What is the importance of the real number line? ▶ Can the students use the properties of real numbers and the real number line? ▶ Can the students work with interval notation on the real line? ▶ Can the students solve inequalities and graph the solution set?	– Warm up exercise – Overhead transparencies – Exercises in book – Worksheets – Graphing Calculator – Technology	• Quizzes • Tests • Homework • Graded assignments • Classroom participation • Questioning • Observation
2.8.11 Algebra and Functions E. Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, byperbolas). 2.9.11 Geometry G. Solve problems using analytic geometry.	▶ Which definitions, properties, and formulas are important to algebraic functions? ▶ Can the students use the definition and properties of absolute value with intervals on the real line? ▶ Can the students use the distance between two points formula and the midpoint formula? ▶ Can the students use the standard equation of the		

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	circle?		
2.8.11 Algebra and Functions Q. Represent functional relationships in tables, charts and graphs. 2.9.11 Geometry J. Analyze figures in terms of the kinds of symmetries they have.	▶ Can the students use the point plot method of graphing? ▶ Can the students find the intercepts for a given equation? ▶ Can the students find symmetry with respect to the x-axis, y-axis, and origin? ▶ Can the students graph an equation using the intercepts and symmetry?	– Warm up exercise – Overhead transparencies – Exercises in book – Worksheets – Graphing Calculator – Technology	• Quizzes • Tests • Homework • Graded assignments • Classroom participation • Questioning • Observation
2.8.11 Algebra and Functions L. Write the equation of a line when given the graph of the line, two points on the line, or the slope of the line and a point on the line.	▶ Can the students find the slope of the line? ▶ Can the students use the point slope equation of the line? ▶ Can the students use the slope-intercept equation of the line? ▶ Can the students using slopes determine if lines are parallel or perpendicular?		

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	▶ Can the students find equations of parallel and perpendicular lines?		
2.8.11 Algebra and Functions S. Analyze properties and relationships of functions (e.g., linear, polynomial, rational trigonometric, exponential, logarithmic). T. Analyze and categorize functions by their characteristics.	▶ Can the students use function notation? ▶ Can the students classify functions? ▶ Can the students determine if the graph of a given relation is a function using the vertical line test?	– Warm up exercise – Overhead transparencies – Exercises in book – Worksheets – Graphing Calculator – Technology	• Quizzes • Tests • Homework • Graded assignments • Classroom participation • Questioning • Observation
2.10.11 Trigonometry A. Use graphing calculators to display periodic and circular functions; describe properties of the graphs. B. Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem.	▶ Can the students use the definitions and properties of trig functions? ▶ Can the students graph trig functions? ▶ Can the students solve trig equations?		