

Algebra 2 for Precalculus (9300) Course Overview Curriculum Document

Course Description

This course is a rigorous extension of earlier mathematics courses in preparation for Pre-Calculus. Students will build upon prior knowledge from Algebra 1 and Geometry with emphasis upon multiple representations of functions (algebraic, graphic, tabular, and descriptive) and application of those functions in a variety of situations. Students may take this course after successful completion of Algebra and Geometry. Strong algebra skills are essential for students enrolling in this course. Students who need to strengthen their algebra skills are encouraged to successfully complete Algebra 2 prior to enrolling in this course.

Credits

1

Prerequisites

9100 Algebra and 9200 Geometry

Board Approved

May 1997

Revised

May 2006, August 2015, June 2023

Required Assessments

District-wide, standards-based common summative assessments

Textbooks/Resources

Kennedy, D, Milou, E., Thomas, C. D., Zbiek, R. M., & Cuocco, A. (2024). enVision Algebra 2. Paramus, NJ: Savvas Learning Company

Course Essential Understandings

- As a result of successfully completing this course, students will:
- Strengthen their understanding of Algebra concepts in preparation for higher level mathematics
 - Analyze functions using different representations
 - Construct and compare linear, quadratic, and exponential models to solve problems
 - Extend their understanding of right triangle trigonometry to the unit circle, using trigonometric functions to model periodic phenomena.

Course Relevance Questions

- How can we use evidence to determine the best model to represent algebraic properties in everyday critical thinking situations?

Unit Overviews

Unit Name	Unit Description	Unit Relevance Question	Instructional Standards	Assessed Standards
Unit # 1 - Linear Functions and Systems	Students will focus on extending previous knowledge of functions. They will identify the key features and how to interpret graphs of functions. Students will learn methods for solving equations, inequalities, and systems of linear equations and inequalities by using tables and graphing.	<ul style="list-style-type: none"> ● How can functions be used to represent and solve problems involving quantities? 		<p>Standard 1: Graphing M.F.IF.B.4 M.F.IF.C.7 M.F.BF.B.3</p> <p>Standard 2: Interpreting M.A.CED.A.3 M.F.IF.A.3 M.F.IF.B.4 M.F.IF.B.5 M.F.IF.B.6 M.F.BF.A.1 M.F.LE.A.2</p> <p>Standard 3: Manipulating M.A.CED.A.3 M.F.BF.A.2 M.F.BF.B.3 M.F.LE.A.2</p> <p>Standard 4: Solving/Evaluating M.A.CED.A.1 M.A.REI.C.6 M.A.REI.D.11 M.F.IF.B.6 M.F.BF.A.1</p>
Unit # 2 -Quadratic Functions and Equations	Students identify different forms of quadratic functions and their key features. Students explore complex numbers and learn different methods for solving quadratic equations including problems with complex numbers.	<ul style="list-style-type: none"> ● How can you solve problems and model situations using quadratic functions? 		<p>Standard 1: Graphing M.A.APR.B.3 M.A.CED.A.2 M.F.IF.B.4 M.F.BF.B.3 M.SP.ID.B.6 M.SP.ID.B.6.a</p> <p>Standard 2: Interpreting M.N.CN.A.1 M.A.SSE.A.1a M.A.SSE.A.2 M.F.IF.B.4 M.SP.ID.B.6 M.SP.ID.B.6.a</p> <p>Standard 3: Manipulating</p>

				<p>M.N.CN.A.2 M.N.CN.A.3 M.A.SSE.A.2 M.A.CED.A.2 M.A.REI.B.4 M.A.REI.B.4.a M.A.REI.B.4.b M.F.BF.B.3</p> <p>Standard 4: Solving/Evaluating M.N.CN.C.7 M.A.SSE.B.3.a M.A.APR.B.3 M.A.REI.B.4 M.A.REI.B.4.a M.A.REI.B.4.b M.A.REI.C.7 M.SP.ID.B.6 M.SP.ID.B.6.a</p>
Unit # 3 - Polynomial Functions	Students will identify the key features of and interpret graphs of polynomial functions. They will learn methods to add, subtract, multiply, and divide polynomial expressions. Additionally students will work to multiply, factor, and transform graphs from cubic or quartic parent functions. Students will understand the roots of a polynomial function.	<ul style="list-style-type: none"> • What can an equation for a polynomial function tell about its graph? • What can a graph of a polynomial function tell about the solutions of a polynomial equation? 	<p>Standard 2: Interpreting M.F.IF.C.9 M.A.APR.B.2</p>	<p>Standard 1: Graphing M.A.APR.B.3 M.F.IF.B.4 M.F.IF.B.6 M.F.IF.C.7</p> <p>Standard 2: Interpreting M.N.CN.C.8 M.N.CN.C.9 M.A.SSE.A.1 M.A.SSE.A.2 M.F.IF.B.4 M.F.IF.B.6 M.F.BF.A.1</p> <p>Standard 3: Manipulating M.N.CN.C.8 M.A.SSE.A.2 M.A.APR.C.4 M.A.APR.D.6</p> <p>Standard 4: Solving/Evaluating M.A.APR.A.1 M.A.APR.B.2 M.A.APR.B.3 M.A.APR.C.4 M.F.IF.B.6 M.F.BF.A.1</p>
Unit # 4 - Rational Functions	Students will extend previous knowledge of polynomial functions to rational functions and identify the significant parts on the graphs as well as methods of solving rational equations.	<ul style="list-style-type: none"> • How do you identify rational functions and their key graphical features? 	<p>Standard 4: Solving/Evaluating M.A.REI.A.1</p>	<p>Standard 1: Graphing M.A.CED.A.2 M.F.IF.C.7 M.F.BF.B.3</p> <p>Standard 2: Interpreting M.A.SSE.A.2</p> <p>Standard 3: Manipulating M.A.SSE.A.2 M.A.APR.D.7 M.A.CED.A.2 M.F.BF.B.3</p> <p>Standard 4: Solving/Evaluating M.A.CED.A.1 M.A.REI.A.2</p>
Unit # 5 - Rational Expressions and Radicals	Students will learn methods to graph radical functions, solve radical equations, and combine functions using basic operations. Students will be able to identify and write the equation of inverses of functions.	<ul style="list-style-type: none"> • How are rational exponents and radical equations used to solve real-world problems? 	<p>Standard 4: Solving/Evaluating M.A.REI.A.1</p>	<p>Standard 1: Graphing M.A.CED.A.4 M.F.IF.B.4 M.F.IF.C.7 M.F.IF.C.7.b M.F.BF.B.3 M.F.BF.B.4</p> <p>Standard 2: Interpreting M.A.SSE.A.2 M.F.IF.B.4 M.F.BF.A.1 M.F.BF.A.1.b M.F.BF.A.1.c</p> <p>Standard 3: Manipulating</p>

				<p>M.N.RN.A.1 M.N.RN.A.2 M.A.SSE.A.2 M.A.CED.A.4 M.F.BF.B.3</p> <p>Standard 4: Solving/Evaluating M.A.REI.A.2 M.F.BF.A.1 M.F.BF.A.1.b M.F.BF.A.1.c M.F.BF.B.4</p>
Unit # 6 - Exponential and Logarithmic Functions	Students will understand logarithms and their properties, and how to solve exponential and logarithmic equations.	<ul style="list-style-type: none"> How do you use exponential and logarithmic functions to model situations and solve problems? 	<p>Standard 4: Solving/Evaluating M.A.REI.A.1</p>	<p>Standard 1: Graphing M.F.IF.B.4 M.F.IF.C.7 M.F.BF.B.3 M.F.BF.B.4</p> <p>Standard 2: Interpreting M.A.SSE.A.1 M.A.SSE.A.2 M.F.IF.B.4 M.F.IF.B.5 M.F.IF.B.6 M.F.IF.C.9 M.F.LE.A.2 M.F.LE.B.5</p> <p>Standard 3: Manipulating M.A.SSE.A.2 M.A.SSE.B.3 M.F.IF.C.8 M.F.BF.B.3 M.F.LE.A.2 M.F.LE.A.4</p> <p>Standard 4: Solving/Evaluating M.A.SSE.B.3 M.A.CED.A.1 M.F.IF.B.6 M.F.BF.B.4 M.F.BF.B.5</p>
Unit #7 - Trig Functions	Students apply what they have learned about trigonometric functions in right triangles to any real number angles, focusing on the connections between the trigonometric values and the unit circle. Students learn methods to solve problems using trigonometric functions.	<ul style="list-style-type: none"> How do you solve real-world situations using trigonometric functions? 	<p>Standard 2: Interpreting M.F.IF.B.6</p>	<p>Standard 1: Graphing M.F.IF.B.4 M.F.IF.B.6 M.F.IF.C.7 M.F.IF.C.7a M.F.IF.C.7e</p> <p>Standard 2: Interpreting M.F.IF.B.4 M.F.IF.C.9 M.F.TF.A.1 M.F.TF.A.2 M.F.TF.A.3 M.F.TF.A.4 M.F.TF.B.5</p> <p>Standard 4: Solving/Evaluating M.F.BF.B.4 M.F.IF.B.6 M.F.TF.C.8 M.G.SRT.D.10 M.G.SRT.D.11</p>