

Algebra 2(9260) Course Overview Curriculum Document

Course Description

In this course, students will revisit key concepts from prerequisite mathematics courses, building upon students’ prior knowledge to develop a more advanced understanding of algebraic relationships. Emphasis will be placed upon multiple representations of functions (algebraic, graphic, tabular, and descriptive) and application of those functions in a variety of situations. Students who need reinforcement of Algebra concepts are strongly encouraged to take this course before taking 9300 Algebra 2 for Pre-Calculus or 9360 Transition to College Mathematics. Students will also explore and strengthen mathematical concepts specifically selected for university and technical college preparation.

Credits

1

Prerequisites

9100 Algebra or 9000A Algebra 1A and 9000B Algebra 1B 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

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? 	Standard 1: Graphing Standard 2: Interpreting Standard 3: Manipulating Standard 4: Solving/Evaluating	Standard 1: Graphing M.A.REI.D.11 M.F.IF.B.4 M.F.IF.B.6 M.F.IF.C.7 M.F.BF.B.3 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 Standard 3: Manipulating M.A.CED.A.3 M.F.BF.A.1 M.F.BF.A.2 M.F.BF.B.3 M.F.LE.A.2 Standard 4: Solving/Evaluating M.A.CED.A.1 M.A.REI.C.6 M.A.REI.D.11 M.F.IF.B.6
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? 	Standard 1: Graphing Standard 2: Interpreting Standard 3: Manipulating Standard 4: Solving/Evaluating	Standard 1: Graphing M.A.CED.A.2 M.A.REI.C.7 M.F.IF.B.4 M.F.BF.B.3 M.S.ID.B.6 Standard 2: Interpreting M.N.CN.A.1 M.A.SSE.A.1a M.A.SSE.A.2 M.A.CED.A.2 M.F.IF.B.4 M.S.ID.B.6 M.S.ID.B.6.a Standard 3:

				<p>Manipulating M.N.CN.A.2 M.N.CN.A.3 M.A.SSE.A.2 M.A.APR.B.3 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 M.S.ID.B.6.a</p> <p>Standard 4: Solving/Evaluating M.N.CN.C.7 M.A.APR.B.3 M.A.REI.B.4 M.A.REI.B.4.a M.A.REI.B.4.b</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 1: Graphing</p> <p>Standard 2: Interpreting</p> <p>Standard 3: Manipulating</p> <p>Standard 4: Solving/Evaluating</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.A.APR.B.2 M.F.IF.B.4 M.F.IF.B.6 M.F.IF.C.9</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 M.F.BF.A.1</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</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 1: Graphing</p> <p>Standard 2: Interpreting</p> <p>Standard 3: Manipulating</p> <p>Standard 4: Solving/Evaluating</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 M.A.CED.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.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 1: Graphing</p> <p>Standard 2: Interpreting</p> <p>Standard 3: Manipulating</p> <p>Standard 4: Solving/Evaluating</p>	<p>Standard 1: Graphing 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</p> <p>Standard 3: Manipulating 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.1 M.A.REI.A.2 M.F.BF.B.4</p>
<p>Unit #6 - Exponential and Logarithmic Functions</p>	<p>Students will understand logarithms and their properties, and how to solve exponential and logarithmic equations.</p>	<ul style="list-style-type: none"> How do you use exponential and logarithmic functions to model situations and solve problems? 	<p>Standard 1: Graphing</p> <p>Standard 2: Interpreting</p> <p>Standard 3: Manipulating</p> <p>Standard 4: Solving/Evaluating</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.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.A.REI.A.1 M.F.IF.B.6 M.F.BF.B.4 M.F.BF.B.5</p>
<p>Unit #7 - Probability and Statistics</p>	<p>Students will apply previous knowledge of basic probability to probability of multiple events, combinatorics, probability distributions, and expected value. Students understand and graph probability distributions and learn methods for using probability models and expected value to make decisions. Students will understand that data distributions can be normal and skewed. Students learn methods to use statistical data to compare groups and formulate and test a hypothesis.</p>	<ul style="list-style-type: none"> How can you find the probability of events and combinations of events? How can you use normal distributions to answer statistical questions? 	<p>Standard 2: Interpreting M.SP.IC.A.1 M.SP.IC.B.3</p>	<p>Standard 1: Graphing M.SP.CP.A.4 M.SP.CP.B.6</p> <p>Standard 2: Interpreting M.SP.CP.A.1 M.SP.CP.A.2 M.SP.CP.A.3 M.SP.CP.A.5 M.SP.CP.B.6 M.SP.IC.A.2</p> <p>Standard 3: Manipulating M.SP.ID.A.2 M.SP.ID.A.4</p> <p>Standard 4: Solving/Evaluating M.SP.CP.A.3 M.SP.CP.B.7 M.SP.CP.B.8 M.SP.CP.B.9 M.SP.ID.A.2 M.SP.ID.A.4</p>