



## Curriculum and Instruction – Mathematics

### Quarter 1

### Algebra II

Quarter 1		Quarter 2			Quarter 3		Quarter 4	
Expressions, Equations, Inequalities Various Functions, Equations & Their Graphs, Linear Systems, Quadratic Functions & Equations		Polynomials, Radicals, Inverses, Logarithms, Exponential Functions			Rational Expressions and Equations, Arithmetic and Geometric Sequences and Series, Probability		Trigonometric Functions, Pythagorean Identities, Unit Circle	
August 6 2018 – October 5, 2018		October 15, 2018 – December 19, 2018			January 7, 2019 – March 8, 2019		March 18, 2019 – May 23, 2019	
<a href="#">A2.A.REI. D.6</a>	<a href="#">A2.A.REI. B.3</a>	<a href="#">A2.A.APR. A.1</a>	<a href="#">A2. F.IF. A.1</a>	<a href="#">A2. F.IF. B.3b</a>	<a href="#">A2.A.REI. A.1</a>	<a href="#">A2.S.CP. A.2</a>	<a href="#">A2.F.TF.A.1</a>	
<a href="#">A2.F.BF. A.1</a>	<a href="#">A2.A.REI. B.3a</a>	<a href="#">A2.A.APR. A.2</a>	<a href="#">A2. F.IF. A.2</a>	<a href="#">A2. F.IF. B.3c</a>	<a href="#">A2.A.REI. A.2</a>	<a href="#">A2.S.CP.A.3</a>	<a href="#">A2.F.TF.A.1a</a>	
<a href="#">A2.F.BF. A.1a</a>	<a href="#">A2. S. ID. B.2</a>	<a href="#">A2.A.REI. A.1</a>	<a href="#">A2. A. CED.A.1</a>	<a href="#">A2. F.IF. B.4a</a>	<a href="#">A2.A.REI. D.6</a>	<a href="#">A2.S.CP.A.4</a>	<a href="#">A2.F.TF.A.1b</a>	
<a href="#">A2.F.BF.A.1b</a>	<a href="#">A2. A.N.Q.A.1</a>	<a href="#">A2.A.REI. A.2</a>	<a href="#">A2. A. CED.A.2</a>	<a href="#">A2. F.IF. B.5</a>	<a href="#">A2.A.SSE. B.3</a>	<a href="#">A2.S.CP.B.5</a>	<a href="#">A2.F.TF.A.2</a>	
<a href="#">A2. A. CED.A.1</a>		<a href="#">A2.A.REI. D.6</a>	<a href="#">A2.N.RN. A.1</a>	<a href="#">A2. F.LE. A.1</a>	<a href="#">A2.F.BF. A.1a</a>	<a href="#">A2.S.CP.B.6</a>	<a href="#">A2.F.TF.B.3</a>	
<a href="#">A2. A. CED.A.2</a>		<a href="#">A2.A.SSE. A.1</a>	<a href="#">A2.N.RN. A.2</a>	<a href="#">A2. F.LE. A.2</a>	<a href="#">A2.F.BF. A.1b</a>	<a href="#">A2. S.ID. A.1</a>	<a href="#">A2.F.TF.B.3a</a>	
<a href="#">A2.A.REI. C.4</a>		<a href="#">A2.A.SSE. B.2/2a</a>	<a href="#">A2.A.APR. B.3</a>	<a href="#">A2. S.ID. B.2</a>	<a href="#">A2.F.BF. A.2</a>	<a href="#">A2. A. APR.C.4</a>	<a href="#">A2.F.TF.B.3b</a>	
<a href="#">A2.REI. C.5</a>		<a href="#">A2.A.SSE. B.3</a>	<a href="#">A2.A.APR. C.4</a>	<a href="#">A2. A.N.Q.A.1</a>	<a href="#">A2. S.IC.A.1</a>	<a href="#">A2. F.BF.B.4</a>	<a href="#">A2. A.N.Q.A.1</a>	
<a href="#">A2.N.C.N. A.1</a>		<a href="#">A2.F.BF. A.1/1a</a>	<a href="#">A2. F.IF. B.3a</a>	<a href="#">A2. F.BF.B.3</a>	<a href="#">A2. S.IC.A.2</a>	<a href="#">A2. A.N.Q.A.1</a>		
<a href="#">A2. N.C.N. A.2</a>		<a href="#">A2.F.BF. A.1b</a>	<a href="#">A2. F.IF.B.3</a>	<a href="#">A2. F.BF.B.4</a>	<a href="#">A2. F. IF.A.1</a>	<a href="#">A2. F. IF.B.3</a>		
<a href="#">A2. N.C.N. B. 3</a>				<a href="#">A2. F.LE.B.3</a>	<a href="#">A2.S.CP. A.1</a>			

### Tennessee Mathematics Standards

■ Major Content

➤ Supporting Content

★(star) Modeling Standard/Domain



### Introduction

Destination 2025, Shelby County Schools' 10-year strategic plan, is designed not only to improve the quality of public education, but also to create a more knowledgeable, productive workforce and ultimately benefit our entire community.

### What will success look like?



In order to achieve these ambitious goals, we must collectively work to provide our students with high quality, college and career ready aligned instruction. The Tennessee State Standards provide a common set of expectations for what students will know and be able to do at the end of a grade. The State of Tennessee provides two sets of standards, which include the Standards for Mathematical Content and The Standards for Mathematical Practice. The Content Standards set high expectations for all students to ensure that Tennessee graduates are prepared to meet the rigorous demands of mathematical understanding for college and career. The eight Standards for Mathematical Practice describe the varieties of expertise, habits of mind, and productive dispositions that educators seek to develop in all students. The Tennessee State Standards also represent three fundamental shifts in mathematics instruction: **focus, coherence and rigor**.

## Instructional Shifts for Mathematics



[Tennessee Mathematics Standards](#)

■ Major Content

➤ Supporting Content

★(star) Modeling Standard/Domain



# Curriculum and Instruction – Mathematics

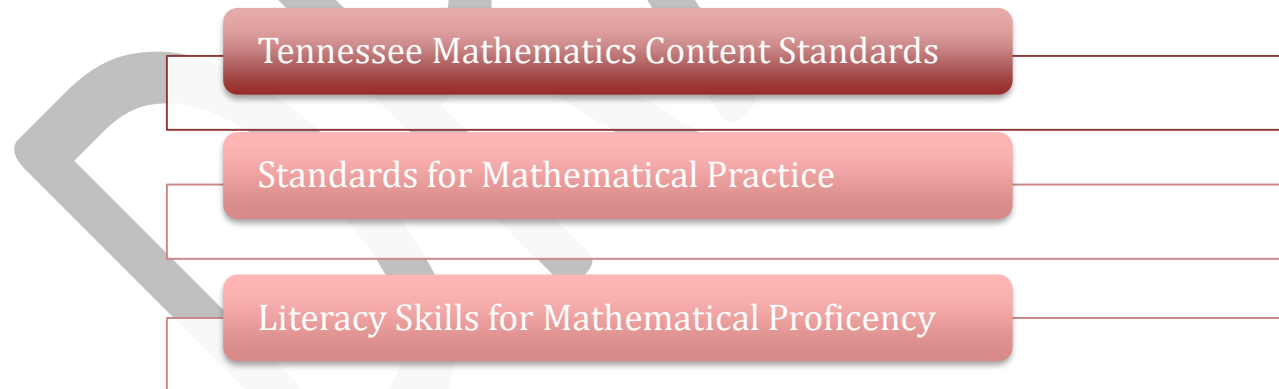
## Quarter 1

## Algebra II

The **Standards for Mathematical Practice** describe varieties of expertise, habits of minds and productive dispositions that mathematics educators at all levels should seek to develop in their students. These practices rest on important National Council of Teachers of Mathematics (NCTM) “processes and proficiencies” with longstanding importance in mathematics education. Throughout the year, students should continue to develop proficiency with the eight Standards for Mathematical Practice. The following are the eight Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of them.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

This curriculum map is designed to help teachers make effective decisions about what mathematical content to teach so that ultimately our students can reach Destination 2025. Throughout this curriculum map, you will see resources as well as links to tasks that will support you in ensuring that students are able to reach the demands of the standards in your classroom. In addition to the resources embedded in the map, there are some high-leverage resources around the content standards and mathematical practice standards that teachers should consistently access. For a full description of each, click on the links below.



[Tennessee Mathematics Standards](#)

■ Major Content

➤ Supporting Content

★(star) Modeling Standard/Domain



## Structure of the Standards

Structure of the TN State Standards include:

- **Content Standards** - Statements of what a student should know, understand, and be able to do.
- **Clusters** - Groups of related standards. Cluster headings may be considered as the big idea(s) that the group of standards they represent are addressing. They are therefore useful as a quick summary of the progression of ideas that the standards in a domain are covering and can help teachers to determine the focus of the standards they are teaching.
- **Domains** - A large category of mathematics that the clusters and their respective content standards delineate and address. For example, Number and Operations – Fractions is a domain under which there are a number of clusters (the big ideas that will be addressed) along with their respective content standards, which give the specifics of what the student should know, understand, and be able to do when working with fractions.
- **Conceptual Categories** – The content standards, clusters, and domains in the 9th-12th grades are further organized under conceptual categories. These are very broad categories of mathematical thought and lend themselves to the organization of high school course work. For example, Algebra is a conceptual category in the high school standards under which are domains such as Seeing Structure in Expressions, Creating Equations, Arithmetic with Polynomials and Rational Expressions, etc.

[Tennessee Mathematics Standards](#)



## How to Use the Maps

### Overview

An overview is provided for each quarter and includes the topics, focus standards, intended rigor of the standards and foundational skills needed for success of those standards.

**Your curriculum map contains four columns that each highlight specific instructional components. Use the details below as a guide for information included in each column.**

### Tennessee State Standards

TN State Standards are located in the left column. Each content standard is identified as Major Content or Supporting Content (for Algebra I, Algebra II & Geometry only). A key can be found at the bottom of the map.

### Content

This section contains learning objectives based upon the TN State Standards. Best practices tell us that clearly communicating measurable objectives lead to greater student understanding. Additionally, essential questions are provided to guide student exploration and inquiry.

### Instructional Support & Resources

District and web-based resources have been provided in the Instructional Support & Resources columns. You will find a variety of instructional resources that align with the content standards. The additional resources provided should be used as needed for content support and scaffolding. The inclusion of vocabulary serves as a resource for teacher planning and for building a common language across K-12 mathematics. One of the goals for Tennessee State Standards is to create a common language, and the expectation is that teachers will embed this language throughout their daily lessons.

[Tennessee Mathematics Standards](#)

■ Major Content

➤ Supporting Content

★(star) Modeling  
Standard/Domain



# Curriculum and Instruction – Mathematics

## Quarter 1

## Algebra II

### Topics Addressed in Quarter

Create and Solve Equations and Inequalities  
 Write and Solve Systems of Linear Equations  
 Solve quadratic equations in One Variable

Solve Quadratic Equations with Real Coefficients that have Complex Solutions  
 Perform Arithmetic Operations with Complex Numbers  
 Solve a System of a Linear and a Quadratic equation in Two Variables

### Overview

In quarter 1 students build upon the reasoning used to solve equations and their fluency in factoring polynomial expressions. They will build functions that model a relationship between two quantities, represent and solve equations and inequalities graphically. Later in the quarter students will solve systems of linear and nonlinear equations to which no real solutions exist and then relate this to the possibility of quadratic equations with no real solutions. Students will then discover that complex numbers can be used in finding real solutions of polynomial equations. To reach this goal, students will work with properties and operations of complex numbers and then apply that facility to factor polynomials with complex zeros.

Content Standard	Type of Rigor
A2.CED.A.1	Procedural Fluency, Application, Conceptual Understanding
A2.CED.A.2	Procedural Fluency, Application, Conceptual Understanding
A2.F.BF.A.1	Conceptual Understanding & Application
A2.A.REI.D.6 (formerly A-REI.D.11)	Conceptual Understanding & Procedural Fluency

### [Tennessee Mathematics Standards](#)

■ Major Content

➤ Supporting Content

★(star) Modeling Standard/Domain



# Curriculum and Instruction – Mathematics

## Quarter 1

## Algebra II

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
<b>Expressions, Equations, and Inequalities</b> (Allow approximately 1 week for instruction, review, and assessment.)			
<p><b>Domain:</b> Creating Equations  <b>Cluster:</b> Create equations that describe number relationships.</p> <p>■ <b>A2.A.CED.A.1</b> Create equations and inequalities in one variable and use them to solve problems. ★  <i>Include equations arising from linear and quadratic functions, and rational and exponential functions.</i>  <i>Tasks have a real-world context.</i></p> <p>■ <b>A2.A.CED.A.2</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.  <i>i) Tasks are limited to square root, cube root, polynomial, rational, and logarithmic functions.</i>  <i>ii) Tasks have a real-world context.</i></p> <p><b>Domain:</b> Quantities  <b>Cluster:</b> Reason quantitatively and use units to solve problems</p> <p>➤ <b>A2.N.Q.A.1</b> Identify, interpret, and justify appropriate quantities for the purpose of descriptive modeling. ★</p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>How do you use patterns to understand mathematics and model situations?</li> <li>How can a problem be solved and why is one method chosen over another?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Students will write and solve equations and justify the solution path chosen.</li> <li>Students will write, solve and graph inequalities and justify the solution path chosen.</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b>            1-4 Solving Equations            1-5 Solving Inequalities</p> <p><b>Glencoe</b>            1-3 Solving Equations            1-5 Solving Inequalities</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Additional Resource(s)</b>  <a href="#">Edutoolbox: Buddy Bags</a>  <a href="#">Edutoolbox: Paulie's Pen</a>  <a href="#">Edutoolbox: Disc Jockey (expressions)</a>  <a href="#">Math Shell: Equations and Identities*</a>  <a href="#">Math Shell: Reasoning with Equations and Inequalities*</a>  <small>* Not accessible via SCS server</small>  <a href="#">HS Flip Book with examples of each Standard</a></p>	<p><b>Vocabulary:</b>            Equation, solution of an equation, inverse operations, identity, literal equation            Compound inequalities</p> <p><b>Writing in Math / Discussion:</b></p> <ul style="list-style-type: none"> <li>Suppose you solve an equation and find that your school needs 4.3 buses for a class trip. Explain how to interpret this solution.</li> <li>What is the difference between solutions to a compound inequality joined by <i>and</i> compared to those joined by <i>or</i>?</li> </ul>
<b>Functions, Equations, and Graphs</b> (Allow approximately 2 weeks for instruction, review, and assessment.)			
<p><b>Domain:</b> Building Functions  <b>Cluster:</b> Build a function that models a relationship between two quantities.</p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>What is a relation and when is a relation a function?</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p>	<p><b>Vocabulary:</b>            Relation, domain, range, function, vertical-line test, function rule, function notation, independent variable, dependent variable</p>

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TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
<p>■ <a href="#">A2. F.BF.A.1</a> Write a function that describes a relationship between two quantities. ★</p> <p>a. Determine an explicit expression, a recursive process, or steps for calculation from a context.</p> <p><i>For example, given cost and revenue functions, create a profit function.</i></p> <p><i>For A2. F.BF.A.1a:</i></p> <p>i) Tasks have a real-world context.</p> <p>ii) Tasks may involve linear functions, quadratic functions, and exponential functions.</p>	<p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Students will identify, interpret, and graph relations and functions.</li> </ul>	<p><b>Pearson</b> 2-1 Relations and Functions</p> <p><b>Glencoe</b> 2-1 Relations and Functions</p> <p><b>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</b></p> <p><b>Additional Resource(s):</b>  <a href="#">e Math Instruction: Unit 2</a>  <a href="#">Illustrative Math: Computing with a 100% Interest Rate</a>  <a href="#">Edutoolbox Task Arc: Creating &amp; Interpreting Functions</a> <ul style="list-style-type: none"> <li><a href="#">Task 1 –Joe’s on the Beach Ice Cream</a></li> <li><a href="#">Task 2 - Jose’s Surfboard</a></li> <li><a href="#">Task 3 - Ocoee Sand Dunes</a></li> <li><a href="#">Task 4 - More Sand Dunes</a></li> <li><a href="#">Task 5- Swimming Pool Depth</a></li> </ul> <a href="#">HS Flip Book with examples of each Standard</a></p>	<p><b>Resources in the Pearson textbook:</b></p> <p>"Solve it," Think About a Plan, Find the Errors, Multiple word problems, Reasoning question, Compare/contrast question, Open-ended questions, and Connections to other real world topics and/or other subjects</p>
<p><b>Domain:</b> Building Functions</p> <p><b>Cluster:</b> Build a function that models a relationship between two quantities.</p> <p>■ <a href="#">A2.F.BF.A.1</a> Write a function that describes a relationship between two quantities.</p> <p>■ <a href="#">A2.F.BF.A.1a</a> Determine an explicit expression, a recursive process, or steps for calculation from a context.</p>	<p><b>Essential Question(s):</b></p> <p>How can the relationship between quantities best be represented?</p> <p><b>Objective(s):</b></p> <p>Students will graph and write linear equations and calculate and interpret the rate of change of a function and real world problems.</p>	<p><b>Use the textbook resources to address procedural fluency.</b></p> <p><b>Pearson</b> 2-3 Linear Functions and Slope-Intercept Form</p> <p><b>Glencoe</b> 2-3 Rate of Change and Slope</p> <p><b>Use the following resources to ensure that</b></p>	<p><b>Vocabulary</b></p> <p>Slope, linear function, linear equations, x-intercept, y-intercept, slope-intercept</p> <p><b>Writing in Math</b></p> <p>Describe the process of finding the rate of change for each of the following:</p> <p>a. a table of values b. a graph c. an equation</p>

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<p>■ <b>A2.F.BF.A.1b</b> Combine standard function types using arithmetic operations.  <i>For example, given cost and revenue functions, create a profit function.</i>            For A2. F.BF.A.1a:            i) Tasks have a real-world context.            ii) Tasks may involve linear functions, quadratic functions, and exponential functions.</p>		<p><i>the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Additional Resources</b>  <a href="#">How to Weigh an Alligator</a>  <a href="#">TN Task: What's the Point</a>  <a href="#">Oil spills on land</a>  <a href="#">Math Shell: Medical Testing *</a>  <a href="#">You're Toast Dude!</a>  <small>* Not accessible via SCS server</small>  <a href="#">HS Flip Book with examples of each Standard</a></p>	
<p><b>Domain:</b> Interpreting Categorical and Quantitative Data</p> <p><b>Cluster:</b> Summarize, represent, and interpret data on two categorical and quantitative variables.</p> <p>➤ <b>A2.S.ID.B.2</b> Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.</p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>How can you model data with a linear function?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Students will write linear equations that model real-world data.</li> <li>Students will make predictions from linear models based upon the data.</li> </ul>	<p><b>Use the textbook resources to address procedural fluency.</b></p> <p><b>Pearson</b>            2-5 Using Linear Models  <b>Glencoe</b>            2-5 Scatter Plots and Lines of Regression and Correlation</p> <p><b>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</b></p> <p><b>Additional Resource(s):</b>  <a href="#">e Math Instruction: Unit 3</a>  <a href="#">NCTM Illuminations: Line of Best Fit</a>  <a href="#">Math Shell: Bird Eggs *</a>  <a href="#">Math Shell: Having Kittens *</a>  <small>* Not accessible via SCS server</small>  <a href="#">HS Flip Book with examples of each Standard</a></p>	

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Algebra II

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
<p><b>Domain:</b> Reasoning with Equations and Inequalities</p> <p><b>Cluster:</b> Represent and solve equations graphically.</p> <p>■ <b>A2.A.REI.D.6 (formerly A.REI.11)</b> Explain why the x-coordinates of the points where the graphs of the equations <math>y = f(x)</math> and <math>y = g(x)</math> intersect are the solutions of the equation <math>f(x) = g(x)</math>; find the approximate solutions using technology. ★</p> <p><i>Include cases where <math>f(x)</math> and/or <math>g(x)</math> are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</i></p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• What is an absolute value function?</li> <li>• Why is there more than one solution for an absolute value?</li> <li>• How can I solve an equation involving absolute values?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Students will graph and find solutions of absolute value functions using a variety of strategies.</li> <li>• The students will apply translations, stretches, compressions, and reflections to the absolute value function.</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b> 2-7 Absolute Value Functions and Graphs</p> <p><b>Glencoe</b> 2-7 Parent Functions and Transformations</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Additional Resources:</b> <a href="#">Absolute Value Functions Lesson &amp; resources</a> <a href="#">Illustrative Math: College Fund</a></p>	<p><b>Vocabulary</b> Absolute value function, axis of symmetry, vertex</p> <p><b>Writing in Math</b> Explain why the reflection of the graph of <math>f(x) = x^2</math> in the y-axis is the same as the graph of <math>f(x) = x^2</math>. Is this true for all reflections of quadratic equations? If not, describe a case when it is false.</p>
<p><b>Linear Systems</b> (Allow approximately 1.5 weeks for instruction, review, and assessment.)</p>			
<p><b>Domain:</b> Reasoning with Equations and Inequalities</p> <p><b>Cluster:</b> Solve systems of equations.</p> <p>➤ <b>A2.A.REI.C.4 (formerly A.REI.C.6)</b> Write and solve a system of linear equations in context.</p> <p><b>Cluster:</b> Represent and solve equations graphically.</p> <p>■ <b>A2.A.REI.D.6 (formerly A.REI.11)</b> Explain why the x-coordinates of the points where the graphs of the equations <math>y = f(x)</math> and <math>y = g(x)</math></p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• How does representing functions graphically help you solve systems of equations?</li> <li>• When can you use substitution to solve a system?</li> <li>• When can you use elimination to solve a system of linear equations?</li> <li>• Why is it helpful to use matrices to solve systems of linear equations?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Students will solve a linear system</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b> 3-1 Solving Systems Using Tables and Graphs 3-2 Solving Systems Algebraically 3-6 Solving Systems Using Matrices</p> <p><b>Glencoe</b> 3-1 Solving Systems of Equations by Graphing 3-2 Solving Systems of Equations Algebraically 4-6 Augmented Matrices</p>	<p><b>Vocabulary</b> System of equations, linear system, solution of a system, Equivalent systems, matrix, matrix element, row operation</p> <p><b>Writing in Math</b></p> <ul style="list-style-type: none"> <li>• Explain how you can determine the consistency and dependence of a system without graphing the system.</li> <li>• Why might you use different methods for solving a system of equations?</li> </ul>

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<p>intersect are the solutions of the equation <math>f(x) = g(x)</math>; find the approximate solutions using technology. ★</p> <p><i>Include cases where <math>f(x)</math> and/or <math>g(x)</math> are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</i></p>	<p>using a graph or a table.</p> <ul style="list-style-type: none"> <li>Students will solve a linear system using substitution.</li> <li>Students will solve a linear system using elimination.</li> <li>Students will represent a system of linear equations with a matrix.</li> <li>Students will solve a system of linear equations with matrices.</li> </ul>	<p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Eureka Math Algebra 2</b> Module 1 Topic C, Lesson 30</p> <p><b>Additional Resources:</b>  <a href="#">Edutoolbox: Amusement Park</a>  <a href="#">Edutoolbox: Gorp Task</a>  <a href="#">Edutoolbox: Delivery Truck</a>  <a href="#">Edutoolbox: Knitting Knots</a>  <a href="#">Math Shell: Printing Tickets *</a>  <a href="#">Cycling Situations</a>  <a href="#">Math Shell: Best Buy Tickets *</a>  <a href="#">Math Shell: Cash Registers *</a>  <a href="#">System of Equations and Inequalities</a>  <a href="#">Flying Through the St Louis Gateway Arch</a>  <small>*Not accessible via SCS server</small>  <a href="#">HS Flip Book with examples of each Standard</a></p>	
<p><b>Quadratic Functions and Equations</b>            Allow approximately 4.5 weeks for instruction, review, and assessment.)</p>			
<p><b>Domain:</b> Reasoning with Equations and Inequalities</p> <p><b>Cluster:</b> Represent and solve equations and inequalities graphically.</p> <p>■ <b>A2.A.REI.D.6 (formerly A-REI.D.11)</b>            Explain why the x-coordinates of the points where the graphs of the equations <math>y = f(x)</math> and <math>y = g(x)</math></p>	<p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>How can you use the system of equations/inequalities to model and solve contextual problems?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Students will identify, compare, and graph</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b>            4-1 Quadratic Functions and Transformations            4-2 Standard Form of a Quadratic Function            4-9 Quadratic Systems</p> <p><b>Vocabulary</b>            Quadratic function, quadratic equation, roots, maximum, minimum, standard form</p> <p><b>Writing in Math</b></p> <ul style="list-style-type: none"> <li>Describe how you determine whether a function is quadratic and if it has a</li> </ul>	

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<p>intersect are the solutions of the equation <math>f(x) = g(x)</math>; find the approximate solutions using technology. ★</p> <p><i>Include cases where <math>f(x)</math> and/or <math>g(x)</math> are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.</i></p> <p><b>Domain:</b> Building Functions</p> <p><b>Cluster:</b> Build a function that models a relationship between two quantities.</p> <ul style="list-style-type: none"> <li>■ <b>A2.F.BF.A.1</b> Write a function that describes a relationship between two quantities.</li> <li>■ <b>A2.F.BF.A.1a</b> Determine an explicit expression, a recursive process, or steps for calculation from a context.</li> <li>■ <b>A2.F.BF.A.1b</b> Combine standard function types using arithmetic operations.</li> </ul> <p><i>For example, given cost and revenue functions, create a profit function.</i></p> <p><i>For A2. F.BF.A.1a:</i></p> <ul style="list-style-type: none"> <li>i) Tasks have a real-world context.</li> <li>ii) Tasks may involve linear functions, quadratic functions, and exponential functions.</li> </ul>	<p>quadratic functions.</p> <ul style="list-style-type: none"> <li>• Students will find and explain solutions of equations using various methods.</li> <li>• Students will solve and graph systems of linear quadratic equations and inequalities.</li> <li>• Students will describe approximate solutions in the context of the real-world scenario</li> <li>• Manipulate with graphing calculator to analyze set of solutions of systems of equations/inequalities in two variables.</li> </ul>	<p><b>Glencoe</b></p> <p>5-1 Graphing Quadratic Functions</p> <p><b>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</b></p> <p><b>Additional Resource(s)</b></p> <ul style="list-style-type: none"> <li><a href="#">e Math instruction: Unit 6</a></li> <li><a href="#">Illustrative Math: Introduction to Polynomials</a></li> <li><a href="#">Illustrative Math: Two Squares are Equal</a></li> <li><a href="#">TN Alg.Task Arc: Developing an Understanding of Quadratics</a></li> <li><a href="#">Edutoolbox: Forms of a Function</a></li> <li><a href="#">Edutoolbox: Vegetable Garden</a></li> <li><a href="#">Edutoolbox Assessment Resources Gr. 11-12: Bottle Rocket &amp; One Rocket Three Equations</a></li> <li><a href="#">Graphing Families of Quadratic Functions (Texas Instruments)</a></li> <li><a href="#">HS Flip Book with examples of each Standard</a></li> </ul>	<p>maximum or minimum value.</p> <ul style="list-style-type: none"> <li>• Is standard form or vertex form the best way to write a quadratic equation?</li> <li>• What are different methods of solving systems of equations and what are the advantages and disadvantages of each?</li> </ul> <p><b>Resources in the Pearson textbook:</b></p> <p>"Solve it," Think About a Plan, Find the Errors, Multiple word problems, Reasoning question, Compare/contrast question, Open-ended questions, and Connections to other real world topics and/or other subjects</p>
<p><b>Domain:</b> Creating Equations</p> <p><b>Cluster:</b> Create equations that describe numbers or relationships.</p> <ul style="list-style-type: none"> <li>■ <b>A2.A.CED.A.1 (formerly A-CED.A.1)</b> Create equations and inequalities in one</li> </ul>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• How can you write the equation of a parabola without knowing the vertex?</li> </ul> <p><b>Objective(s):</b></p>	<p><b>Use the textbook resources to address procedural fluency.</b></p> <p><b>Pearson</b></p> <p>4-3 Modeling with Quadratic Functions</p>	<p><b>Vocabulary</b></p> <p>Standard form</p>

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<p>variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> ★</p> <p><i>Include equations arising from linear and quadratic functions, and rational and exponential functions.</i></p> <p><i>Tasks have a real-world context.</i></p> <p><b>Domain:</b> Interpreting Categorical and Quantitative data</p> <p><b>Cluster:</b> Summarize, represent, and interpret data on two categorical and quantitative variables.</p> <p>➤ <b>A2.S.ID.B.2</b> Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.</p>	<ul style="list-style-type: none"> <li>Students will model data with quadratic functions.</li> </ul>	<p><b>Glencoe</b> 5.8 Quadratic Inequalities</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Additional Resource(s):</b>  <a href="#">e Math instruction: Unit 6</a>  <a href="#">Edutoolbox Assessment Resources Gr. 11-12: Root of the Problem; Food to Go;</a>  <a href="#">TN Alg Task Arc: Developing an Understanding of Quadratics Circus Act</a>  <a href="#">Illustrative Math: Buying a Car</a>  <a href="#">Illustrative Math: Planes and Wheat</a>  <a href="#">Ball Bounce (Texas Instruments)</a>  <a href="#">HS Flip Book with examples of each Standard</a></p>	<p><b>Writing in Math</b> Name two real world situations that need the quadratic function and explain your reasoning.</p>
<p><b>Domain:</b> The Complex Number System</p> <p><b>Cluster:</b> Use complex numbers in polynomial identities and equations.</p> <p>➤ <b>A2.N.CN.B.3 (formerly N-CN.B.7)</b> Solve quadratic equations with real coefficients that have complex solutions.</p> <p><b>Domain:</b> Reasoning with Equations and Inequalities</p> <p><b>Cluster:</b> Solve equations and inequalities in one variable</p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>How can features of polynomial functions such as the equation, solutions, axis of symmetry, vertex, etc. be represented in tables, equations, and in “real world” contexts?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Students will solve quadratic equations by factoring, by using a table, and by graphing.</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b> 4-5 Quadratic Equations</p> <p><b>Glencoe</b> 5-2 Solving Quadratic Equations by Graphing</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p>	<p><b>Vocabulary</b> Factored form, Zero of the function, Zero-Product Property</p> <p><b>Writing in Math</b> Explain how to solve a quadratic equation by graphing its related quadratic function.</p> <p><b>Resources in the Pearson textbook:</b> " Solve it," Think About a Plan, Find the Errors,</p>

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<p>➤ <b>A2.A.REI.B.3</b> Solve quadratic equations and inequalities in one variable.</p> <p>a. Solve quadratic equations by inspection (e.g., for <math>x^2 = 49</math>), taking square roots, completing the square, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as <math>a \pm bi</math> for real numbers <math>a</math> and <math>b</math>.</p>	<ul style="list-style-type: none"> <li>Students will identify the zeros of a polynomial where appropriate and graph the function defined by the polynomial</li> </ul>	<p><b>Eureka Math</b> Module 1-Topic D Lesson 36</p> <p><b>Additional Resources</b>  <a href="#">TN Task, Alg. 2- Boxed In</a>  <a href="#">TN Task, Alg. 1 - Cliffhanger</a>  <a href="#">TN Task, Alg. 1 - Fencing for Josephine's garden (linear and quadratic)</a>  <a href="#">HS Flip Book with examples of each Standard</a></p>	
<p><b>Domain:</b> Reasoning with Equations and Inequalities</p> <p><b>Cluster:</b> Solve systems of equations.</p> <p>➤ <b>A2.A.REI.B.3 (formerly A-REI.B.4)</b> Solve quadratic equations in one variable.</p> <p>Scope &amp; Clarifications: In the case of equations that have roots with nonzero imaginary parts, students write the solutions as <math>a \pm bi</math> for real numbers <math>a</math> and <math>b</math>.</p> <p>a. Solve quadratic equations by inspection (e.g., for <math>x^2 = 49</math>), taking square roots, completing the square, applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as <math>a \pm bi</math> for real</p>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>Why structure expressions in different ways?</li> <li>Why is the Quadratic Formula important?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>Students will find common and binomial factors of quadratic expressions.</li> <li>Students will solve equations, and solve problems involving functions by completing the square.</li> <li>Students will solve quadratic equations using the Quadratic Formula.</li> <li>Students will determine the number of solutions by using the discriminant.</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b> 4-6 Completing the Square 4-7 The Quadratic Formula</p> <p><b>Glencoe</b> 5-5 Completing the Square 5.6 Quadratic Formula and the Discriminant</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Additional Resource(s):</b>  <a href="#">e Math instruction: Unit 6</a>  <a href="#">Illustrative Math: Braking Distance</a>  <a href="#">Illustrative Math: Zero Product Property 4</a>  <a href="#">Illustrative Math: Completing the Square</a></p>	

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<p>numbers a and b.</p> <p><b>Domain:</b> The real number system</p> <p><b>Cluster:</b> Perform Arithmetic operations with complex numbers</p> <ul style="list-style-type: none"> <li>➤ A2.N.CN.B.3 Solve quadratic equations with real coefficients that have complex solutions.</li> </ul>		<p><a href="#">HS Flip Book with examples of each Standard</a></p>	
<p><b>Domain:</b> The Complex Number System</p> <p><b>Cluster:</b> Perform arithmetic operations with complex numbers.</p> <ul style="list-style-type: none"> <li>➤ A2.N.CN.A.1 (formerly N-CN.A.1) Know there is a complex number <math>i</math> such that <math>i^2 = -1</math>, and every complex number has the form <math>a + bi</math> with <math>a</math> and <math>b</math> real.</li> <li>➤ A2.N.CN.A.2 (formerly N-CN.A.2) Know and use the relation <math>i^2 = -1</math> and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</li> </ul>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• What are complex numbers?</li> </ul> <p><b>Objective(s):</b></p> <ul style="list-style-type: none"> <li>• Students will identify, graph, and perform operations with complex numbers.</li> <li>• Students will determine the number of solutions by using the discriminant.</li> </ul>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b> 4-8 Complex Numbers</p> <p><b>Glencoe</b> 5.4 Complex Numbers and the Complex Plane</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Additional Resource(s):</b>  <a href="#">e Math instruction</a>  <a href="#">Illustrative Math: Complex Number Patterns</a>  <a href="#">Illustrative Math: Powers of a Complex Number</a>  <a href="#">Classifying Complex Numbers</a></p>	
<p><b>Domain:</b> Reasoning with Equations and Inequalities</p> <p><b>Cluster:</b> Solve systems of equations.</p> <ul style="list-style-type: none"> <li>➤ A2.A.REI.C.5 (formerly A-REI.C.7) Solve a simple system consisting of a linear equation and a quadratic equation</li> </ul>	<p><b>Essential Question(s):</b></p> <ul style="list-style-type: none"> <li>• What are the various methods that one can use to solve quadratic inequalities?</li> </ul> <p><b>Objective(s):</b></p>	<p><i>Use the textbook resources to address procedural fluency.</i></p> <p><b>Pearson</b> 4.9 Quadratic Systems</p> <p><b>Vocabulary:</b> No new vocabulary</p> <p><b>Writing in Math:</b> Describe how the methods used to solve systems of linear equations are similar to the methods used to solve a quadratic system.</p>	

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<p>in two variables algebraically and graphically. For example, find the points of intersection between the line <math>y = -3x</math> and the circle <math>x^2 + y^2 = 3</math>.</p>	<ul style="list-style-type: none"> <li>• Students will solve and graph systems of linear and quadratic equations.</li> <li>• Students will find the point(s) of intersection of a linear function and a quadratic function.</li> <li>• Students will solve a system consisting of a linear equation and a quadratic equation algebraically.</li> </ul>	<p><b>Glencoe</b> 10.7 Solving Linear-Nonlinear Systems</p> <p><i>Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.</i></p> <p><b>Eureka Math</b> Module 1 Lessons 31-32</p> <p><b>Additional Resource(s):</b>  <a href="#">Illustrative Math: Pythagorean Triples</a>  <a href="#">Illustrative Math: The Circle and the Line</a>  <a href="#">Graphing Calculator Investigation</a>  <a href="#">HS Flip Book with examples of each Standard</a></p>	

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■ Major Content

➤ Supporting Content

★(star) Modeling Standard/Domain





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### RESOURCE TOOLBOX

<p><b>Textbook Resources</b></p> <p><b>Pearson:</b>  <a href="http://www.pearsonsuccessnet.com">http://www.pearsonsuccessnet.com</a></p> <p><b>Online Tools</b>          Think About a Plan (Editable)          Standardized Test Prep          Extra Practice (Editable)          Find the Errors!          Enrichment (Editable)          Solve It!          ELL Support (Editable)          Activities, Games, and Puzzles (Editable)          Teaching with TI Technology          Homework Video Tutors          Lesson Quizzes          Assessments          Reteaching (Editable)          Common Core Lessons          Standardized Test Prep          Performance Tasks</p>	<p><b>Glencoe:</b>  <a href="https://connected.mcgraw-hill.com/connected/login.do">https://connected.mcgraw-hill.com/connected/login.do</a></p> <p><b>Online Tools</b>          Chapter Animation          Chapter Quizzes &amp; Tests          Editable Worksheets          Anticipation Guides          Personal Tutors          Lesson PowerPoints          Enrichment Masters          Graphing Calculator Activities</p>	<p><b>Standards</b></p> <p><a href="#">Common Core Standards - Mathematics</a>  <a href="#">Common Core Standards - Mathematics Appendix A</a>  <a href="#">Edutoolbox (formerly TNCore)</a>  <a href="#">The Mathematics Common Core Toolbox</a>  <a href="#">PARCC Blueprints and Test Specifications FAQ</a>  <a href="#">CCSS Toolbox</a>  <a href="#">New York Education Department Tasks</a>  <a href="#">PARCC High School Math Tasks</a>  <a href="#">TICommonCore.com</a>  <a href="#">TN Department of Education Math Standards</a>  <a href="#">PARCC Practice Test</a>  <a href="#">HS Flip Book with Examples of each Standard</a>  <a href="#">JMAP</a></p>	<p><b>Videos</b></p> <p><a href="#">Brightstorm</a>  <a href="#">Teacher Tube</a>  <a href="#">The Futures Channel</a>  <a href="#">Khan Academy</a>  <a href="#">Math TV</a>  <a href="#">Lamar University Tutorial</a>  <a href="#">e Math instruction</a></p>
<p><b>Additional Sites</b></p> <p><a href="#">TN Dept. of Education Assessment Live Binder</a>  <a href="#">e Math instruction</a>  <a href="#">UT Dana Center</a>  <a href="#">Mars/Math Shell Tasks* (Not accessible via SCS server)</a>  <a href="#">Inside Math Tasks</a>  <a href="#">Math Vision Project Tasks</a>  <a href="#">Better Lesson</a>  <a href="#">SCS Math Tasks</a>  <a href="#">Dana Center Algebra 2 Assessments</a>  <a href="#">Graphic Organizers (9-12)</a>  <a href="#">University of Idaho Literacy Strategies</a></p>	<p><b>Interactive Manipulatives</b></p> <p><a href="#">Illuminations (NCTM)</a>  <a href="#">National Math Resources</a>  <a href="#">NASA Space Math</a>  <a href="#">Math Vision Project</a>  <a href="#">Purple Math</a></p> <p><b>ACT</b></p> <p><a href="#">TN ACT Information &amp; Resources</a>  <a href="#">ACT College &amp; Career Readiness Mathematics Standards</a></p>	<p><b>Calculator</b></p> <p><a href="#">Math Nspired</a>  <a href="#">Texas Instrument Activities</a>  <a href="#">Casio Activities</a></p> <p><b>NWEA MAP</b>  <b>Resources:</b> <a href="https://teach.mapnwea.org/assist/help_map/ApplicationHelp.htm#UsingTestResults/MAPReportsFinder.htm">https://teach.mapnwea.org/assist/help_map/ApplicationHelp.htm#UsingTestResults/MAPReportsFinder.htm</a> - Sign in and Click the Learning Continuum Tab – this resources will help as you plan for intervention, and differentiating small group instruction on the skill you are currently teaching. (Four Ways to Impact Teaching with the Learning Continuum)  <a href="https://support.nwea.org/khanrit">https://support.nwea.org/khanrit</a> - These Khan Academy lessons are aligned to RIT scores.</p>	

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