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	
A2.A.REI. D.6	A2.A.REI. B.3	A2.A.APR. A.1	A2. F.IF. A.1	A2. F.IF. B.3b	A2.A.REI. A.1	A2.S.CP. A.2	A2.F.TF.A.1	
A2.F.BF. A.1	A2.A.REI. B.3a	A2.A.APR. A.2	A2. F.IF. A.2	A2. F.IF. B.3c	A2.A.REI. A.2	A2.S.CP.A.3	A2.F.TF.A.1a	
A2.F.BF. A.1a	A2. S. ID. B.2	A2.A.REI. A.1	A2. A. CED.A.1	A2. F.IF. B.4a	A2.A.REI. D.6	A2.S.CP.A.4	A2.F.TF.A.1b	
A2.F.BF.A.1b	A2. A.N.Q.A.1	A2.A.REI. A.2	A2. A. CED.A.2	A2. F.IF. B.5	A2.A.SSE. B.3	A2.S.CP.B.5	A2.F.TF.A.2	
A2. A. CED.A.1		A2.A.REI. D.6	A2.N.RN. A.1	A2. F.LE. A.1	A2.F.BF. A.1a	A2.S.CP.B.6	A2.F.TF.B.3	
A2. A. CED.A.2		A2.A.SSE. A.1	A2.N.RN. A.2	A2. F.LE. A.2	A2.F.BF. A.1b	A2. S.ID. A.1	A2.F.TF.B.3a	
A2.A.REI. C.4		A2.A.SSE. B.2/2a	A2.A.APR. B.3	A2. S.ID. B.2	A2.F.BF. A.2	A2. A. APR.C.4	A2.F.TF.B.3b	
A2.REI. C.5		A2.A.SSE. B.3	A2.A.APR. C.4	A2. A.N.Q.A.1	A2. S.IC.A.1	A2. F.BF.B.4	A2. A.N.Q.A.1	
A2. N.C.N. A.1		A2.F.BF. A.1/1a	A2. F.IF. B.3a	A2. F.BF.B.3	A2. S.IC.A.2	A2. A.N.Q.A.1		
A2. N.C.N. A.2		A2.F.BF. A.1b	A2. F.IF.B.3	A2. F.BF.B.4	A2. F. IF.A.1	A2. F. IF.B.3		
A2. N.C.N. B. 3				A2. F.LE.B.3	A2.S.CP. A.1			

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?

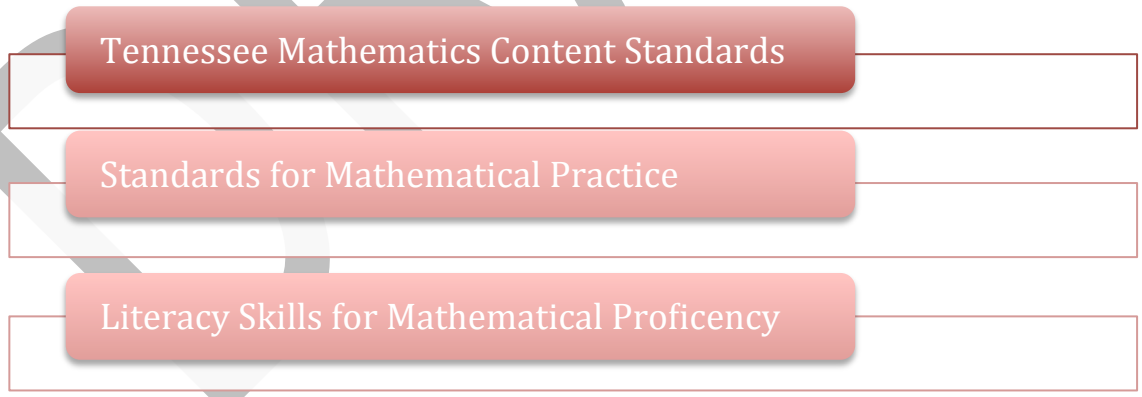
In order to achieve these ambitious goals, we must collectively work to provide our students with high quality, college and career ready aligned instruction. The Tennessee State Standards provide a common set of expectations for what students will know and be able to do at the end of a grade. The State 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**.

■Major Content ➢ Supporting Content (star) Modeling Standard/Domain

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

Topics Addressed in Quarter

- **Trigonometric Functions**
- **Pythagorean Identities**
- **Unit Circle**

Overview

During quarter four students will extend their understanding of functions and the real numbers, and increase their toolset for modeling in the real world. Students extend their notion of number to include trigonometric functions and identities. Students explore trigonometric functions through graphing, solving, technology, and learning their properties. Building on their work with linear, quadratic, exponential, radical, and rational functions, in Algebra II students extend their repertoire of functions to include trigonometric functions. After the TNReady assessment, students work closely with reviewing functions and continue to expand and hone their abilities to model and analyze situations that involve quadratic, exponential, radical, rational and trigonometric functions.

TN Department of Education Assessment Live Binder

Tennessee Mathematics Standards

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES
Trigonometric Functions and the Unit Circle **(Allow approximately 2-3 weeks for instruction, review, and assessment.)**		
Domain Trigonometric Functions **Cluster:** Extend the domain of trigonometric functions using the unit circle. ➢ **A2. F.TF.A.1** (formerly F-TF.A.1) Understand and use radian measure of an angle. a. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. (formerly F-TF.A.1) b. Use the unit circle to find sin □, cos □, and tan □ when □ is a commonly recognized angle between 0 and 2□. *Commonly recognized angles include all multiples nπ /6 and nπ /4, where n is an integer.* ➢ **A2. F.TF.A.2** (formerly F-TF.A.2) Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	**Essential Question(s):** • What is meant by the radian measure of an angle? • What is the connection between the radian measure of an angle and the length of the arc on the unit circle the angle intercepts? • What does the unit circle have to do with trigonometric functions? How can this help solve real-world problems? **Objective(s):** • Students will work with angles in standard position. • Students will find coordinates of points in the unit circle. • Students will define and evaluate sine, cosine and tangent. • Students use special triangles to geometrically determine the values of sine, cosine and tangent for 30, 45, 60, and 90 degrees. • Students define the secant function and the co-functions in terms of points on the unit circle. • Students use reciprocal relationships to relate the trigonometric functions and use these relationships to evaluate trigonometric functions. • Students will solve problems that model trigonometric functions. (Eureka)	***Use the textbook resources to address procedural fluency.*** **Pearson** 13-2 Angles and the Unit Circle **Glencoe** 13.2 Angles and Angle Measure 13.3 Trigonometric Functions of General Angles 13.6 Circular Functions ***Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Eureka Algebra II Module 2**, **Topic A** (engageny.com), Lessons 1-3, 9 **Additional Resources** e Math instruction: Unit 11 Paper Plate Unit Circle Blank and Filled out Unit Circle Handout GSE Introduction to Trigonometric Functions *Figuring Out All the Angles* *Real Numbers and the Unit Circle* *Trigonometric Functions on the Unit Circle* *Un Wrapping the Unit Circle* Illuminations: Rolling into Radians	**Vocabulary** Standard position, initial side, terminal side, coterminal angles, unit circle, cosine of □, sine o □, Tangent of □, tangent function, central angle, intercepted arc, radian **Writing in Math/Discussion** Two angles are measured in radians. Explain how to tell whether the angles are coterminal without rewriting their measures in degrees Summarize how the quadrant in which the terminal side of an angle lies affects the sign o the sine and cosine of that angle. Explain how you can write a tangent function that has the same period as y = sin 4□. **Resources in the Pearson textbook:** " 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

Tennessee Mathematics Standards

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		The Trig Hand Trick Converting between radians and degrees (video) Finding cosine and sine of radian measures (video) Finding the length of an arc (video) HS Flip Book with Examples of each Standard ACT Practice Tests	
Domain Trigonometric Functions **Cluster:** Extend the domain of trigonometric functions using the unit circle. ➢ **A2. F.TF.A.1** (formerly F-TF.A.1) Understand and use radian measure of an angle. a. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. (formerly F-TF.A.1) b. Use the unit circle to find sin , cos , and tan when is a commonly recognized angle between 0 and 2. *Commonly recognized angles include all multiples nπ /6 and nπ /4, where n is an integer.* ➢ **A2. F.TF.A.2** (formerly F-TF.A.2) Explain how the unit circle in the coordinate plane enables the extension of trigonometric	**Essential Question(s):** • When do you want a measurement in degrees? In radians? • What similarities do the sine and cosine graph have? Differences? • Why does the tangent graph have asymptotes? **Objective(s):** • Students will use radian measure for angles. • Students will find the length of the arc of the circle. • Students explore horizontal scalings of the graph of y =sin(x). • Students convert between degrees and radians. • Students graph the sine, cosine and tangent functions and analyze the shape of these curves.	***Use the textbook resources to address procedural fluency.*** **Pearson** 13-3 Radian Measure 13-4 The Sine Function 13-5 The Cosine Function 13-6 The Tangent Function **Glencoe** 13.7 Graphing Trigonometric Functions ***Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Eureka Algebra II Module 2, Topic A,** Lessons 4-7	**Vocabulary** Central angle, intercepted arc, radian, sine function, cosine function, sine curve **Writing in Math/Discussion** Two angles are measured in radians. Explain how to tell whether the angles are coterminal without rewriting their measures in degrees. What does a sine function remind you of in the real world? What does a cosine function remind you of in the real world?

Tennessee Mathematics Standards

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. **Domain:** Quantities **Cluster:** Reason quantitatively and use units to solve problems. ➢ **A2. N.Q.A.1** (formerly N-Q.B.2) Identify, interpret, and justify appropriate quantities for the purpose of descriptive modeling.	• For the sine and cosine functions, students sketch graphs showing key features	**Additional Resources** Math Vision Project Task: More "Sine" Language Math Vision Project Task: Diggin' It Math Vision Project Task: Stalking It Math Vision Project Task: "Sine"ing and "Cosine"ing It Property Rules HS Flip Book with Examples of each Standard	
Trigonometric Identities **(Allow approximately 2 weeks for instruction, review, and assessment)**			
Domain Trigonometric Functions **Cluster:** Prove and apply trigonometric identities. ➢ **A2. F.TF.B.3** Know and use trigonometric identities to find values of trig functions. **a.** Given a point on a circle centered at the origin, recognize and use the right triangle ratio definitions of *sin* , *cos* , and *tan* to evaluate the trigonometric functions. **b.** Given the quadrant of the angle, use the identity $sin^2 + cos^2 = 1$ to find *sin* given *cos* , or vice versa. *Commonly recognized angles include all multiples nπ /6 and nπ /4, where n is an integer.*	**Essential Question(s):** What are the six formulas needed to verify trigonometric identities? **Objective(s):** • Students prove and use the Pythagorean identity $\sin^2(x) + \cos^2(x) = 1$ • Students will verify and apply trigonometric identities.	***Use the textbook resources to address procedural skill and fluency.*** **Pearson** 14-1 Trigonometric Identities **Glencoe** 14.1 Trigonometric Identities ***Use the following resources to ensure that the intended outcome and level of rigor of the standards are met.*** **Eureka Algebra II Module 2, Topic B,** Lessons 15-17	**Vocabulary** Trigonometric Identity, Pythagorean identities **Journaling/Prompt** Develop your own trigonometric identity. Hint: Start with a simple trigonometric expressio and work backwards. Have students to write an identity and exchange with a peer to solve it. **Resources in the Pearson textbook:** " 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

Tennessee Mathematics Standards

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES	
		Additional Resources Illustrative Math: Trig Ratios and the Pythagorean Theorem NYC Culminating Task: Ferris Wheel Task Math Bits Trigonometric Concepts (Lessons & Resources) HS Flip Book with Examples of each Standard **End of the Course Review**	topics and/or other subjects
Review of Major Content/Additional Topics **(Allow approximately 4-5 weeks for instruction, review, and assessment)**			
See previous quarters for the **major work** review. Review those standards to ensure that students are prepared for their **final exam**, their **4th year course**, and/or the ACT. TN Department of Education Mathematics Standards ACT College & Career Readiness Mathematics Standards		***Use previous lessons and tasks not assigned/completed.*** ***Additional topics may be addressed/included based upon student needs. These include:*** ➢ ***Matrices*** ***Pearson-Ch. 12; Glencoe- Ch. 4*** ➢ ***Introduction to Conics*** ***Pearson-Ch. 10; Glencoe- Ch. 10*** **Additional Lessons & Resources** (*Make sure that the intended outcome and rigor of the standard is addressed, based upon TN State Algebra 2 Standards or standards from a 4th year course.*)	

Tennessee Mathematics Standards

TN STATE STANDARDS	CONTENT	INSTRUCTIONAL SUPPORT & RESOURCES
		➢ TN ACT Information & Resources (see *ACT Educator Resources*) ➢ Math Bits Notebook Lessons and Resources ➢ e Math instruction ➢ SCS Math Tasks (Algebra II) ➢ Edutoolbox.com (Assessment & Instructional Resources) ➢ HS Flip Book with Examples of each Standard

RESOURCE TOOLBOX

Tennessee Mathematics Standards

Textbook Resources

Pearson:

http://www.pearsonsuccessnet.com

Online Tools

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

Glencoe:

https://connected.mcgraw-hill.com/connected/login.do

Online Tools

Chapter Animation
Chapter Quizzes & Tests
Editable Worksheets
Anticipation Guides
Personal Tutors
Lesson PowerPoints
Enrichment Masters
Graphing Calculator Activities

Standards

Common Core Standards - Mathematics
Common Core Standards - Mathematics Appendix A
Edutoolbox (formerly TNCore)
The Mathematics Common Core Toolbox
PARCC Blueprints and Test Specifications FAQ
CCSS Toolbox
New York Education Department Tasks
PARCC High School Math Tasks
TICommonCore.com
TN Department of Education Math Standards
PARCC Practice Test
HS Flip Book with Examples of each Standard
JMAP

Videos

Brightstorm
Teacher Tube
The Futures Channel
Khan Academy
Math TV
Lamar University Tutorial
e Math instruction

Additional Sites

TN Dept. of Education Assessment Live Binder
e Math instruction
UT Dana Center
Mars/Math Shell Tasks* (**Not accessible via SCS server)**
Inside Math Tasks
Math Vision Project Tasks
Better Lesson
SCS Math Tasks
Dana Center Algebra 2 Assessments
Graphic Organizers (9-12)
University of Idaho Literacy Strategies

Interactive Manipulatives

Illuminations (NCTM)
National Math Resources
NASA Space Math
Math Vision Project
Purple Math

ACT

TN ACT Information & Resources
ACT College & Career Readiness Mathematics Standards

Calculator

Math Nspired
Texas Instrument Activities
Casio Activities

NWEA MAP

Resources:https://teach.mapnwea.org/assist/help_map/ApplicatinHelp.htm#UsingTestResults/MAPReportsFinder.htm - Sign in an Click the Learning Continuum Tab – this resources will help as yo plan for intervention, and differentiating small group instruction on the skill you are currently teaching. (Four Ways to Impact Teachir with the Learning Continuum)

https://support.nwea.org/khanrit - These Khan Academy lessons are aligned to RIT scores.

Tennessee Mathematics Standards

■Major Content ➢ Supporting Content ⍰(star) Modeling Standard/Domain