Marking Period: 4	Unit Title: Analytic Trigonometry	Recommended Instruction Days: 15 - 20

Standard-New Jersey Student Learning Standards: F-TF, G-SRT
Analytic Trigonometry (Chapter 5)

Strand:
F-TF: Trigonometric Functions

Prove and apply trigonometric identities

8. Prove the Pythagorean identity $sin^2\theta + cos^2\theta = 1$and use it to calculate trigonometric ratios.
9. Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.

G-SRT: Similarity, Right Triangles, and Trigonometry

Apply trigonometry to general triangles

9. Derive the formula A=1/2absinC for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side
10. Prove the Law of Sines and Cosines and use them to solve problems
11. Understand and apply the Law of Sines and the law of Cosines to find unknown measurements in right and non-right triangles.

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*

Stephen Hawking - Despite living with amyotrophic lateral sclerosis, Stephen Hawking is a world-renowned physicist who is credited with groundbreaking discoveries involving quantum theory and general relativity, among others

The mission is to ensure that every student is able to see themselves in our rich and diverse history.

Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***
Self-Awareness Social Awareness	• Recognizing the importance of self-confidence in handling daily tasks and challenges. • Demonstrate an awareness of the expectations for social interactions in a variety of ways.

Self-Management Relationship Skills Responsible Decision-Making	• Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Recognize the skills needed to establish and achieve personal and educational goals. • Utilize positive communication and social skills to interact effectively with others. • Develop, implement, and model effective problem solving and critical thinking skills.

Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit

Essential Questions	Progress Indicators	Activity Description
• How can trigonometric identities be used to simplify and solve trigonometric expressions and equations? • What is the Law of Sines and how is it used with real-world applications? • What is the Law of Cosines and how can it be applied?	• Tests • Quizzes • Practice problems for homework • Worksheets • Leveled assessments • Projects	❖ Fundamental Identities ❖ Proving Trigonometric Identities ❖ The Law of Sines ❖ The Law of Cosines ❖ Example Tasks Below **Interdisciplinary Connections:** **Comprehensive Health and Physical Education Domain: Movement Skills and Concepts** The base on a baseball diamond is 90 feet apart, and the front edge of the pitcher's rubber is 60.5 feet from the back corner of the home plate. Find the distance from the center of the front edge of the pitcher's rubber to the far corner of first base. **Answer:** $c^2 = 60.5^2 + 90^2 - 2(60.5)(90)cos45$ $c = \sqrt{60.5^2 + 90^2 - 2(60.5)(90)cos45}$ c=63.7

The distance from first base to the pitcher's rubber is about 63.7 feet.

Task

Simplify $\sin\theta(cot\theta + tan\theta)$

Answer

$sin\theta(cot\theta + tan\theta)$

$sin\theta(\frac{cos\theta}{sin\theta} + \frac{sin\theta}{cos\theta})$

$cos\theta + \frac{sin^2\theta}{cos\theta}$

$\frac{cos^2\theta}{cos\theta} + \frac{sin^2\theta}{cos\theta}$

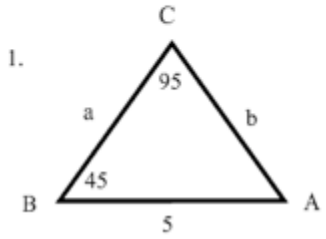
$\frac{1}{cos\theta}$

$sec\theta$

Task

Use the Law of Sines to solve the following triangle:

1.



Answer

		• $180 - 95 - 45 = 40 = A$ $\frac{\sin 40}{a} = \frac{\sin 95;}{5}$ a = 3.23 $\frac{\sin 45}{b} = \frac{\sin 95;}{5}$ b = 3.55 **Spot Light On:** *Show students the why behind how things are done when possible.*

Mathematical Practices

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
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.**

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessment: ● Entry and Exit Slips ● Quizzes ● Self Assessments ● Focus Packets	**Benchmarks:** ● Chapter Tests ● Projects **Summative Assessments:** ● District assessments

Differentiated Student Access to Content: **Teaching and Learning *Resources/Materials***			
Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
online albert resource online achievethecore resource online learnzillion resource online khanacademy resource online desmos resource online edulastic resource	Reteaching worksheets Skill building workbook Math manipulatives Leveled practice worksheets	Dictionary for native language Video tutorial in native language Success for English Learners worksheets Leveled Strategies for English Learners Linguistic Support	Enrichment worksheets Art of Problem Solving Leveled assessments

Supplemental Resources

- Technology: Chromebooks, Graphing Calculators, Smartboards,
- Other: Zoom and Google Meets, Schoology, Google Classroom

Differentiated Student Access to Content: Recommended *Strategies & Techniques*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat	Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.	Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	x	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	x	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*