Marking Period	Unit Title	Recommended Instructional Days
3	Trigonometric Equations and Identities	14-15 days

Domain:

NJSLS Strand:

A-CED.1 Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions*.

A-CED.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A-CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods*

Progress Indicator:
Tests ● Quizzes ● Practice problems for homework ● Online textbook ● Worksheets ● IXL ● Leveled assessments

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

Essential Question/s:
How do trigonometric identities and equations help you solve problems involving real or complex numbers?

Activity Description:
Solving Trigonometric equations using inverses
Law of sines and law of cosines
Trigonometric Identities
The complex Plan
Polar form of Complex Numbers

Interdisciplinary Connections:

Technology:
8.2.12.D.1:

Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.

Example Tasks:
At the end of each topic please review the Assessment Practice and Performance Tasks questions.

F-IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given in a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.** **F-IF.5** Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.** **F-IF.**7. Graph functions expressed symbolically and show key features if the graph,		Mixed Review Available Online **ASSESSMENT PRACTICE** **37.** Solve the equation $4 \sin^2 \pi - 3 = 0$ for π measured in radians. Determine if each of the following are part of the solution set. Select *Yes* or *No*. a. $\frac{\pi}{6} + 2k\pi$, where k is an integer — Yes ❑ No ❑ b. $\frac{\pi}{3} + k\pi$, where k is an integer — Yes ❑ No ❑ c. $\frac{\pi}{3} + 2k\pi$, where k is an integer — Yes ❑ No ❑ d. $\frac{2\pi}{3} + 2k\pi$, where k is an integer — Yes ❑ No ❑ e. $\frac{2\pi}{3} + k\pi$, where k is an integer — Yes ❑ No ❑ f. $\frac{5\pi}{6} + k\pi$, where k is an integer — Yes ❑ No ❑

by hand in simple cases and using technology for more complicated cases.*
a.Graph linear and quadratic functions and show intercepts, maxima, and minima
b.Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
c.Graph polynomial functions, identifying zeros, when suitable factorizations are available, and showing end behavior.
d.(+) Graph rational functions, identifying zeros, and asymptotes when suitable factorizations are available, and showing end behavior.
e.Graph exponential and logarithmic functions, showing intercept and end behavior, and trigonometric functions, showing period, midline, and amplitude.
F-BF.3 Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x +k) for specific values of k

ASSESSMENT PRACTICE

35. In $\triangle EFG$, $m\angle E = 35°$, $e = 5.8$, and $f = 10$. Choose *Yes* or *No* to tell whether each is a possible value for $m\angle F$.

	Yes	No
There are no possible values.	❑	❑
6.2°	❑	❑
60.3°	❑	❑
81.5°	❑	❑
98.5°	❑	❑
119.7°	❑	❑

(both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*

F-TF.5 Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.

F-TF.6(+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.

F-TF.7(+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

F-TF.8 Prove the Pythagorean identity $\sin^2\theta + \cos^2\theta = 1$

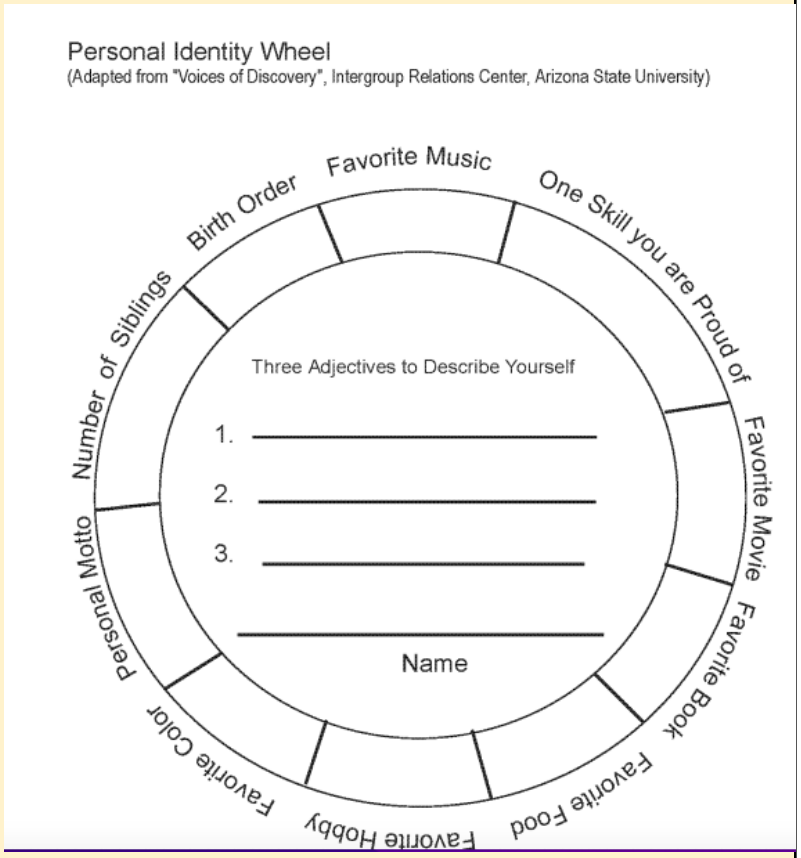
39. Performance Task The Washington Monument is 555 ft tall. The angle of elevation from the end of the monument's shadow to the top of the monument has a cosecant of 1.10.

Part A What is the measure of the angle θ?

Part B What is the distance *d* from the end of the monument's shadow to the top of the monument? Round to the nearest tenth of a foot.

Part C What is the length *l* of the monument's shadow? Round to the nearest tenth of a foot.

and use it to calculate trigonometric ratios.		**37. Performance Task** Teo is standing 80 yd from the base of a Mayan pyramid. The side of the pyramid is 100 ft from base to peak.  **Part A** How many feet from the base of the pyramid is Teo? **Part B** What is the measure of angle *P* formed by the side of the pyramid and Teo's line of sight? **Part C** What is the distance in a straight line from Teo to the peak *x*? **Spot Light on: Diversity** Students should reflect on and discuss the identities that are most important to them. This activity will help students get to know each other better and allow them to express important parts of their identities that may otherwise not be known. Students should be

		asked to reflect on the value of their identities by considering which of those is most and least important to them and why that may be. 
Mathematics Practices		

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

Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***
Self- awareness Social Awareness Self- Management Relationship Skills Responsible Decision-Making	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. 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.

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 Assessments: ● Entry and Exit Slips ● Quizzes ● Self Assessments	**Benchmarks:** ● Chapter Tests ● Projects **Summative Assessments:** ● District Assessments ● Midterms ● Standardized Tests

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
● Textbooks websites ● Achieve the core ● Khan Academy ● Desmos	● Skill building worksheets ● Math Manipulatives	● Dictionary for native languages ● Videos in their native language.	● Leveled Assessments ● Enrichment worksheets

Supplemental Resources

Technology:
- **Chromebooks, Graphing Calculators, Online math manipulatives**

Other:
- **Zoom and Google Meets, Google Classroom, Interactive Textbooks**

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	Alternate Core Resources *IEP/504/At-Risk/ESL*	ELL Core Resources	Gifted & Talented Core
● **Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed,**	● **Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional**	● **Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental**	● **Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based**

modify assessments and/or rubrics, repeat	**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.**	**materials including use of an online bilingual dictionary, and modified assessment and/or rubric.**	**extension activities, and connect student to related**

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept: Creativity and Innovation**	
	Core Ideas:	Cultivating online reputations for employers and academia requires separating private and professional digital identities.
	Performance Expectation/s:	9.4.12.DC.6: Select information to post online that positively impacts personal image and future college and career opportunities.
	Career Readiness, Life Literacies, & Key Skills Practices	
	Act as a responsible and contributing community member and employee. **Attend to financial well-being.** **Consider the environmental, social and economic impacts of decisions.** **Demonstrate creativity and innovation.** **Utilize critical thinking to make sense of problems and persevere in solving them.** **Model integrity, ethical leadership and effective management.** **Plan education and career paths aligned to personal goals.** **Use technology to enhance productivity, increase collaboration and communicate effectively.** **Work productively in teams while using cultural/global competence.**	

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*		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*