Pre-Calculus

Implement start year – 2014-2015

Revision Committee Members, email, extension

Chris Melograna cmelograna@lrhsd.org ext. 8679
Christina Mull cmull@lrhsd.org ext. 8051
Joanne Wagner jwagner@lrhsd.org ext. 8887
Maryann Wilson mwilson@lrhsd.org ext. 8665

Unit #5, Analytical Trig

Transfer Goal: Students will be able to independently use their learning to recognize that any problem can be solved using a variety of methods or techniques.

Stage 1 – Desired Results

Established Goals

2009 NJCCC Standard(s), Strand(s)/CPI #
(http://www.nj.gov/education/cccs/2009/final.htm)

Common Core Curriculum Standards for Math and English
(http://www.corestandards.org/)

HSF-TF.B

- Model periodic phenomena with trig functions.

HSF-TF.C

- Prove and apply trigonometric identities

HSF-SRT.D.10,11

- Apply trigonometry to general triangles

21st Century Themes (www.21stcenturyskills.org)

☒ Global Awareness
☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy
☒ Health Literacy
☒ Environmental Literacy

21st Century Skills

Learning and Innovation Skills:
☒ Creativity and Innovation
☒ Critical Thinking and Problem Solving
☒ Communication and Collaboration

Information, Media and Technology Skills:
☒ Information Literacy
☒ Media Literacy
☒ICT (Information, Communications and Technology) Literacy

Life and Career Skills:
☒ Flexibility and Adaptability
☒ Initiative and Self-Direction
☒ Social and Cross-Cultural Skills
☒ Productivity and Accountability
☒ Leadership and Responsibility

Enduring Understandings:

Students will understand that . . .

EU 1

- Trig identities can be used to identify non special angles

EU 2

- There is more than one way to prove a trig identity

EU 3

- Given 3 parts of any type of triangle you can find side lengths and angle measurements

Essential Questions:

EU 1

Why is it necessary to use identities when finding the value of a non special angle?

EU 2

Why is there more than one way to prove a trig identity?

EU 3

- Why is it necessary to have multiple ways to solve triangles?

Knowledge:

Students will know . . .

EU 1

The sum, difference, half angle and double angle formulas

EU 2

The Pythagorean, reciprocal, even and odd, and quotient identities

EU 3

The formulas for the Law of Sines and Law of Cosines

Skills:

Students will be able to . . .

EU 1

- Apply sum and difference, half angle, and double angle formulas
- Determine when it is appropriate to use each formula

EU 2

- Apply Pythagorean, reciprocal, even and odd, and quotient identities to verify identities
  Verify trig identities by substituting equivalent trig expressions
- Solve trig equations

EU 3

- Apply law of sines and law of cosines based on given information
  Recognize SSA ambiguous case results in 3 different outcomes
  Apply law of sines to SSA ambiguous case to determine the number of solutions

Stage 2 – Assessment Evidence

Recommended Performance Tasks: Trig "Identity" EU2

Other Recommended Evidence: *Tests, Quizzes, Prompts, Self-assessment, Observations, Dialogues, etc.*

- Quiz simplifying and verifying trig identities
- Quiz on solving trig equations
- Quiz on sum, difference, double, and half angle identities
- Quiz on Law of Sines and Law of Cosines
- Assessed elements from recommended performance task.

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: *Consider the WHERETO elements. Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.*

Activity #1: Use a trig identity jigsaw puzzle to match up trig identities. (M)

Activity #2: TI-nspire Law of Sines Activity (A)
http://education.ti.com/en/us/activity/detail?id=E8F17149BCDC472DB81151C215C09C49&ref=/en/us/activity/search/subject?d=F988B132B1A74080AC6C1D0A68C5E3BB&s=B843CE852FC5447C8DD88F6D1020EC61&sa=2728754A144142118F13165941B9056E&t=56E01D9A93944E09997CEE1F620F4F86

Activity #3: Students must create 4 word problems where an oblique triangle can be drawn to solve each situation. Students must create a "student worksheet" as well as an answer worksheet. Students will exchange their worksheets with a partner and solve and check their partner's solutions. (T)

* More activities (including instructions and rubrics) are available at http://precalculus.lrhsd.org

The following is a suggested sequence of learning activities for the Accelerated Pre-Calculus class. Approximate days for completion: 26. Adjustments should be made accordingly for other levels.

- YWBAT simplify trig expressions (A)
- YWBAT verify using trig identities (A)
- YWBAT solve trig equations (A, M)
- YWBAT use sum and difference identities (A)
- YWBAT use double angle identities (A)
- YWBAT use half angle identities (A)
- YWBAT apply of Law of Sines (A, M)
- YWBAT apply Law of Cosines (A, M)
- Performance Task (M, T)

Critical Vocabulary

Reciprocal Identities	Quotient Identities	Pythagorean Identities	Even/Odd Identities	Co-Function Identities	
Sum/Difference Identities	Double Angle Identities	Half Angle Identities	Law of Sines	Ambiguous Case	Law of Cosines

Performance Task Helpful Rubric

:

	1	2	3
Passport/Background Story 20%	The passport is not organized and is missing some components. Background story missing details about situation.	The passport is organized but is missing some components. Background story is complete with details about situation.	The passport is organized and has all components of a passport. Background story is complete with details about situation.
Trigonometric Identities 25%	We did not use correct trig identities to change the identity of our original trig function.	We correctly used the trigonometric identities to "change" the identity of our original trig function. However, we were not efficient.	We correctly and efficiently used the trigonometric identities to "change" the identity of our original trig function.
Records information efficiently 20%	We recorded data in an unorganized way.	We recorded data neatly and in an efficient manner.	We recorded data neatly and in an efficient manner allowing for analysis in several different ways.
Organization 15%	We did not organize our information in a concise of meaningful way.	We organized information in a useful way but not as concise as possible.	We organized the information in the most concise and useful mathematical way.
Inverse Functions 20%	We did not use the inverse functions to determine the domain.	We used inverse functions but made a minor mistake.	We properly used inverse function to determine the domain.