

13/14 Trigonometry

Content Area: **Math**
Course(s): **Accelerated Algebra II**
Time Period: **Marking Period 3**
Length: **3**
Status: **Published**

Unit Overview

This unit allows students to master the main ideas in periodic functions and trigonometry. Students will explore the 6 trig functions and graph sine and cosine.

Enduring Understandings

Periodic behavior is behavior that repeats over intervals of constant length.

The measure of an angle in standard position is the input for two important functions. The outputs are the coordinates (sine and cosine) of the point on the terminal side of the angle that is 1 unit from the origin.

An angle with a full circle rotation measures 2π radians.

You can translate periodic functions in the same way that you translate other functions.

Cosine, sine, and tangent have reciprocals.

Essential Questions

How can you model periodic behavior?

What function has as its graph a sine curve with amplitude 4, period π and a minimum at the origin?

If you know the value of $\sin \theta$, how can you find $\cos \theta$, $\tan \theta$, $\csc \theta$, $\sec \theta$, and $\cot \theta$?

How do you model sine and cosine graphically?

New Jersey Student Learning Standards (No CCS)

Modeling Standards:

MA.F-TF

Trigonometric Functions

MA.F-TF.A

Extend the domain of trigonometric functions using the unit circle

MA.F-TF.A.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
MA.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.
MA.F-TF.A.3	Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosines, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x , where x is any real number.
MA.F-TF.A.4	Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
MA.F-TF.B	Model periodic phenomena with trigonometric functions
MA.F-TF.B.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.
MA.F-TF.B.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.
MA.F-TF.B.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.
MA.F-TF.C	Prove and apply trigonometric identities

Interdisciplinary Connections

LA.W.9-10.6	Use technology, including the Internet, to produce, share, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

Technology Standards

TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.D.CS3	Exhibit leadership for digital citizenship.
TECH.8.1.12.E.CS4	Process data and report results.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.C.CS2	The application of engineering design.

21st Century Themes/Careers

CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
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Financial Literacy Integration

PFL.9.1.12.C.1	Compare and contrast the financial benefits of different products and services offered by a variety of financial institutions.
PFL.9.1.12.C.2	Compare and compute interest and compound interest and develop an amortization table using business tools.
PFL.9.1.12.C.3	Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit.

Instructional Strategies & Learning Activities

- Use graphing calculator to explore tables.
- Spend time with modeling activities.
- Spend at least one day dedicated to modeling problems
- Use problems and activities from book involving modeling problems
- Provide access to online book
- Provide access to book pages and problems through Canvas and Twitter
- Provide access to review keys
- Assign ExamView Questions to provide practice and assessment.

Formative Assessments

- Daily homework checks
- ExamView Questions
- Exit Tickets
- Warm-ups
- Quizzes

Summative Assessment

- Unit Tests