



Standard #: MAFS.912.F-TF.2.5

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Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. ★

	Grade: 912
Cluster: Model periodic phenomena with trigonometric functions. (Algebra 2 - Additional Cluster) - Clusters should not be sorted from Major to Supporting and then taught in that order. To do so would strip the coherence of the mathematical ideas and miss the opportunity to enhance the major work of the grade with the supporting clusters.	Date Adopted or Revised: 02/14
Content Complexity Rating: Level 2: Basic Application of Skills & Concepts - More Information	Date of Last Rating: 02/14
Status: State Board Approved	

Related Courses

Course Number	Course Title
1200330:	Algebra 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200340:	Algebra 2 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1202340:	Pre-Calculus (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1211300:	Trigonometry (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1298310:	Advanced Topics in Mathematics (formerly 129830A) (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200335:	Algebra 2 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2019 (course terminated))
1201315:	Analysis of Functions Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))

Related Access Points

Access Point

Access Points Number	Access Points Title
MAFS.912.F-TF.2.AP.5a:	Choose basic trigonometric functions to model cosine and sine graphs.
MAFS.912.F-TF.2.AP.5b:	Choose basic trigonometric functions to model cosine and sine graphs with a specified amplitude. Choose basic trigonometric functions to model cosine and sine graphs with a specified amplitude.
MAFS.912.F-TF.2.AP.5c:	Choose basic trigonometric functions to model cosine and sine graphs with a specified midline.
MAFS.912.F-TF.2.AP.5d:	Choose basic trigonometric functions to model cosine and sine graphs with a specified frequency.

Related Resources

Problem-Solving Task

Name	Description
As the Wheel Turns:	In this task, students use trigonometric functions to model the movement of a point around a wheel and, through space. Students also interpret features of graphs in terms of the given real-world context.
Foxes and Rabbits 2:	This problem solving task challenges students to trigonometric functions to model the populations of rabbits and foxes over time, and then graph the functions.
Foxes and Rabbits 3:	This problem solving task challenges students to use trigonometric functions to model the number of rabbits and foxes as a function of time.

Lesson Plan

Name	Description
Calculating the Earth-Sun distance using Satellite Observations of a Venus Transit:	Every school child learns that the earth-sun distance is 93 million miles. Yet, determining this distance was a formidable challenge to the best scientists and mathematicians of the 18th and 19th centuries. The purpose of this lesson is to use the 2012 Transit of Venus as an opportunity to work through the mathematics to calculate the earth-sun distance. The only tools needed are basic knowledge of geometry, algebra, and trigonometry. The lesson is self-contained in that it includes all the data needed to work through the exercise.

City Temperatures and the Cosine Curve:	Students will work with temperature data from San Antonio, Texas and Buenos Aires, Argentina. They will view the periodicity of the city temperatures and build cosine functions to fit the data. The function equation results are then used to find temperatures for a given day, or certain days for a given temperature.
Ferris Wheel:	This lesson is intended to help you assess how well students are able to: <ul style="list-style-type: none"> • Model a periodic situation, the height of a person on a Ferris wheel, using trigonometric functions. • Interpret the constants a, b, c in the formula $h = a + b \cos ct$ in terms of the physical situation, where h is the height of the person above the ground and t is the elapsed time.
Sine Curves and Biorhythms:	This is an activity in which students find their personal biorhythms using sine functions. Biorhythms are 3 cycles (physical, emotional, and intellectual) thought to affect our behavior and performance. The biorhythms have 3 different period lengths. Students need to compute the number of days they have lived to find where they are in these cycles. Students find the equations of the functions and then graph on a graphing calculator.
Tune In and Sine:	This lesson is intended to show students how to use the equations and graphs of sine and cosine to model real-world applications particularly using amplitude, period, and midline.

Perspectives Video: Expert

Name	Description
Electromagnetism:	The director of the National High Magnetic Field Laboratory describes electromagnetic waves.
Mathematically Exploring the Wakulla Caves:	The tide is high! How can we statistically prove there is a relationship between the tides on the Gulf Coast and in a fresh water spring 20 miles from each other?

Virtual Manipulative

Name	Description
Function Flyer:	In this online tool, students input a function to create a graph where the constants, coefficients, and exponents can be adjusted by slider bars. This tool allows students to explore graphs of functions and how adjusting the numbers in the function affect the graph. Using tabs at the top of the page you can also access supplemental materials, including background information about the topics covered, a description of how to use the application, and exploration questions for use with the java applet.

Assessment

Name	Description
Sample 4 - High School Algebra 2 State Interim Assessment:	This is a State Interim Assessment for 9th-12th grade.

Student Resources

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Electromagnetism:	The director of the National High Magnetic Field Laboratory describes electromagnetic waves.
Foxes and Rabbits 2:	This problem solving task challenges students to trigonometric functions to model the populations of rabbits and foxes over time, and then graph the functions.
Foxes and Rabbits 3:	This problem solving task challenges students to use trigonometric functions to model the number of rabbits and foxes as a function of time.
Function Flyer:	In this online tool, students input a function to create a graph where the constants, coefficients, and exponents can be adjusted by slider bars. This tool allows students to explore graphs of functions and how adjusting the numbers in the function affect the graph. Using tabs at the top of the page you can also access supplemental materials, including background information about the topics covered, a description of how to use the application, and exploration questions for use with the java applet.
Mathematically Exploring the Wakulla Caves:	The tide is high! How can we statistically prove there is a relationship between the tides on the Gulf Coast and in a fresh water spring 20 miles from each other?

Parent Resources

Name	Description
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Electromagnetism:	The director of the National High Magnetic Field Laboratory describes electromagnetic waves.
Foxes and Rabbits 2:	This problem solving task challenges students to trigonometric functions to model the populations of rabbits and foxes over time, and then graph the functions.

