GLENDALE UNIFIED SCHOOL DISTRICT

Senior High School

May 1, 2001

Department:	Mathematics
Course Title:	Trigonometry
Course Number:	
Grade Levels:	9, 10, 11, 12
Semester Hours:	5 (1 semester)
Recommended Prerequisite:	Completion of Algebra 2AB with a C or higher
Approved Text:	Trigonometry, Fourth Edition By Roland Larson & Robert Hostetler Copyright 1997 by Houghton Mifflin Company ISBN: 0-669-41737-8

Course Description: Trigonometry is a discipline that utilizes the techniques of both the algebra and geometry that students have previously learned. The trigonometric functions studied are defined geometrically, rather than in terms of algebraic equations. Facility with these functions, as well as being able to prove basic identities regarding them, is especially important for students intending to study calculus, more advanced mathematics, physics and other sciences, and engineering in college.

The course outline that follows is presented two ways:

A.   Sorted by Standards

1.   Where each Standard is identified, along with the sections in the book that addresses the standard.

B.   Sorted by Materials

1.   The first column lists each section in the book.

2.   The second column identifies standard(s) addressed within the section.

3.   The third column is suggested time on topic.

4.   The last column identified possible assessment tools to measure students' mastery of the standard.

TRIGONOMETRY COURSE OUTLINE

Standard / Objective	Materials	Time	Assessment(s)
— 1 —			
Students understand the notion of angles, and how to measure it, both in degrees & radians. They can convert between degrees & radians.	Section 1.1 Trigonometry Functions: Radian & Degree Measure	2 days	Chapter 1 Test
— 2 —			
Students know the definition of sine and cosine as y and x coordinates of points on the unit circle, and are familiar with the graphs of the sine and cosine functions.	Sections 1.2 and 1.5 Trigonometry Functions: Definition of Trig Functions	4 days	Chapter 1 Test
— 3 —			
Students know the identity $\cos^2(x)+\sin^2(s) = 1$	Sections 2.1, 2.2 and 2.3 Trig. Identities & Equations: Trigonometric Identities	5 days	Chapter 2 Test
— 3.1 —			
Students prove that this identity is equivalent to the Pythagorean theorem (i.e., students can prove this identity using the Pythagorean theorem, and conversely they can prove the Pythagorean theorem as a consequence of this identity.)	∨	∨	∨

TRIGONOMETRY COURSE OUTLINE

Standard / Objective	Materials	Time	Assessment(s)
3.2 Students prove other trigonometric identities, and simplify others using the identity $\cos^2(x) + \sin^2(s) = 1$ (e.g., students use this identity to prove that $\sec^2(s) - \tan^2(x) + 1$).			
4 Student graph functions of the form $f(t) = A\sin(Bt + 0)$ or $f(t) = A\cos(Bt + 0)$, and interpret A, B, and 0 in terms of amplitude, frequency, period, and phase shift.	Section 1.5 Graphs of Trig. Functions: Graphs of Six Trigonometric Functions	2 days	Chapter 1 Test Section Quiz Project: Solving Equations Graphically
5 Students know the definition of the tangent and cotangent functions, and can graph them.	Section 1.6 Trigonometry Functions: Definition of Trig Functions	2 days	Chapter 1 Test Section Quiz
6 Students know the definitions of the secant and cosecant functions, and can graph them.	Section 1.6 Trigonometry Functions: Definition of Trig Functions	2 days	Chapter 1 Test
7 Students know that the tangent of the angle a line makes with the x-axis is equal to the slope of the line.	Page 264 Trigonometry Functions: Definition of Trig Functions	2 days	Project: Solving Equations Graphically

TRIGONOMETRY COURSE OUTLINE

Standard / Objective	Materials	Time	Assessment(s)
8			
Students know the definitions of the inverse trigonometric functions, and can graph the functions.	Section 1.7 Graphs of Trig. Functions: Inverses & Graphs of Inverses of Trig Functions	3 days	Chapter 1 Test
9			
Students compute, by hand, the values of the trigonometric functions and the inverse trigonometric functions at various standard points.	Section 1.8 Graphs of Trig Functions: Inverses & Graphs of Inverses of Trig. Functions	3 days	Chapter 1 Test
10			
Students demonstrate understanding of the addition formulas for sines and cosines, their proofs, and use them to prove and/or simplify other trigonometric identities.	Section 2.4 Trig. Identities & Equations: Trigonometric Identities	5 days	Chapter 2 Test Section Quiz
11			
Students demonstrate understanding of half angle and double angle formulas for sines and cosines, and can use them to prove and/or simplify other trigonometric identities.	Section 2.5 Trig. Identities & Equations: Trigonometric Identities	5 days	Chapter 2 Test Section Quiz
12			
Students use trigonometry to determine unknown sides or angles in right triangles.	Section 1.3 Solving Triangles: Right Triangle Trigonometry	3 days	Chapter 1 Test Section Quiz

TRIGONOMETRY COURSE OUTLINE

Standard / Objective	Materials	Time	Assessment(s)
— 13 —			
Students know the Laws of Sines and the Law of Cosines, and apply them to problems.	Sections 3.1, 3.2 and 3.3 Solving Triangles: Trigonometric Applications	6 days	Chapter 3 Test Section 3.1 Quiz Section 3.2 Quiz
— 14 —			
Students determine the area of a triangle given one angle and the two adjacent sides.	Section 3.1 Solving Triangles: Area of Triangles	2 days	Chapter 3 Test Section 3.1 Quiz Section 3.2 Quiz
— 15 —			
Students are familiar with polar coordinates. In particular, they can determine polar coordinates of a point given in rectangular coordinates, and vice versa.	Section 6.7 Polar Coordinates: Polar - Rectangular Coordinates	5 days	Chapter 6 Test Section 6.7 Quiz Project: Graphing in Parametric & Polar Modes
— 16 —			
Students represent equations given in rectangular coordinates in terms of polar coordinates.	Section 6.8 Polar Coordinates: Polar Equations	5 days	Chapter 6 Test Section 6.8 Quiz Project: Graphing in Parametric & Polar Modes
— 17 —			
Students are familiar with complex numbers. They can represent a complex number in polar form, and know how to multiply complex numbers in their polar form.	Sections 4.1, 4.3 and 6.9 Complex Numbers: Complex Numbers Trig Form of Complex #s	10 days	Chapter 4 Test Chapter 6 Test Project: Fractals

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TRIGONOMETRY COURSE OUTLINE

Standard / Objective	Materials	Time	Assessment(s)
18			
Students know DeMoivre's Theorem, and can give n-th roots of a complex number given in polar form.	Section 4.4 Complex Numbers: DeMoivre's Theorem	5 days	Chapter 4 Test
19			
Students are adept at using trigonometry in a variety of applications and word problems.	Solving Triangles: Trigonometric Applications pages 125-6, 135, 145-7, 157, 167, 169-170, 179, 180-2, 192-3, 197-206, 208-211	10 days	Project: Analyzing a Graph

TRIGONOMETRY COURSE OUTLINE

Sorted by Text Materials (Trigonometry, 4th Edition)

Materials	Standard / Objective	Time	Assessment(s)
Section 1.1 Trigonometry Functions: Radian & Degree Measure	Students understand the notion of angles, and how to measure it, both in degrees and radians. They can convert between degrees and radians. (1)	2 days	Section Quizes Chapter 1 Test ¦ v
Sections 1.2 Trigonometry Functions: Definition of Trig Functions	Students know the definition of sine and cosine as y and x coordinates of points on the unit circle, and are familiar with the graphs of the sine and cosine functions. (2)	2 days	
Section 1.3 Solving Triangles: Right Triangle Trigonometry	Students use trigonometry to determine unknown sides or angles in right triangles. (12)	3 days	
Section 1.5 Trigonometry Functions: Definition of Trig Functions	Students know the definition of sine and cosine as y and x coordinates of points on the unit circle, and are familiar with the graphs of the sine and cosine functions. (2) Student graph functions of the form $f(t) = A\sin(Bt + 0)$ or $f(t) = A\cos(Bt + 0)$, and interpret A, B, and 0 in terms of amplitude, frequency, period, and phase shift. (4)	4 days	
Section 1.6 Trigonometry Functions: Definition of Trig Functions	Students know the definition of the tangent & cotangent functions, and can graph them. (5) Students know the definitions of the secant and cosecant functions, & can graph them. (6)	4 days	

TRIGONOMETRY COURSE OUTLINE

Sorted by Text Materials (Trigonometry, 4th Edition)

Materials	Standard / Objective	Time	Assessment(s)
Section 1.7 Graphs of Trig. Functions: Inverses & Graphs of Inverses of Trig Functions	Students know the definitions of the inverse trigonometric functions, and can graph the functions. (8)	3 days	
Section 1.8 Graphs of Trig Functions: Inverses & Graphs of Inverses of Trig. Functions	Students compute, by hand, the values of the trigonometric functions and the inverse trigonometric functions at various standard points. (9)	3 days	
Section 2.1 Trig. Identities & Equations: Trigonometric Identities	Students know the identity $\cos^2(x) + \sin^2(s) = 1$ (Standard 3)	1 day	Section Quizes Chapter 2 Test │ │ ∨
Section 2.2 Trig. Identities & Equations: Trigonometric Identities	Students prove that this identity is equivalent to the Pythagorean theorem (i.e., students can prove this identity using the Pythagorean theorem, and conversely they can prove the Pythagorean theorem as a consequence of this identity.) (3.1)	2 days	
Section 2.3 Trig. Identities & Equations: Trigonometric Identities	Students prove other trigonometric identities, and simplify others using the identity $\cos^2(x) + \sin^2(s) = 1$ (e.g., students use this identity to prove that $\sec^2(s) - \tan^2(x) + 1$). (3.2)	2 days	

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TRIGONOMETRY COURSE OUTLINE

Sorted by Text Materials (Trigonometry, 4th Edition)

Materials	Standard / Objective	Time	Assessment(s)
Section 2.4 Trig. Identities & Equations: Trigonometric Identities	Students demonstrate understanding of the addition formulas for sines and cosines, their proofs, and use them to prove and/or simplify other trigonometric identities. (10)	5 days	
Section 2.5 Trig. Identities & Equations: Trigonometric Identities	Students demonstrate understanding of half angle and double angle formulas for sines and cosines, and can use them to prove and/or simplify other trigonometric identities. (11)	5 days	
Section 3.1 Solving Triangles: Law of Sines	Students know the Laws of Sines and of Cosines, and apply them to problems. (13) Students determine the area of a triangle given one angle and the two adjacent sides. (14)	2 days	Section Quizes Chapter 3 Test ¦ V
Section 3.2 Solving Triangles: Law of Cosines	Students know the Laws of Sines and of Cosines, and apply them to problems. (13)	2 days	
Section 3.3 Solving Triangles: Area of Triangles	Students know the Laws of Sines and of Cosines, and apply them to problems. (13)	2 days	
Section 4.1 Complex Numbers: Complex Numbers	Students are familiar with complex numbers. They can represent a complex number in polar form, and know how to multiply complex numbers in their polar form. (17)	3 days	Section Quizes Chapter 4 Test Project: Fractals ¦ V

TRIGONOMETRY COURSE OUTLINE
Sorted by Text Materials (Trigonometry, 4th Edition)

Materials	Standard / Objective	Time	Assessment(s)
Section 4.3 Complex Numbers: Complex Numbers Trig Form of Complex #s	Students are familiar with complex numbers. They can represent a complex number in polar form, and know how to multiply complex numbers in their polar form. (17)	3 days	
Section 4.4 Complex Numbers: DeMoivre's Theorem	Students know DeMoivre's Theorem, and can give n-th roots of a complex number given in polar form. (18)	5 days	
Section 6.7 Polar Coordinates: Polar - Rectangular Coordinates	Students are familiar with polar coordinates. In particular, they can determine polar coordinates of a point given in rectangular coordinates, and vice versa. (15)	5 days	Section Quizes Chapter 6 Test Project: Graphing in Parametric & Polar Modes ∨
Section 6.8 Polar Coordinates: Polar Equations	Students represent equations given in rectangular coordinates in terms of polar coordinates. (16)	5 days	
Section 6.9 Polar Coordinates:	Students are familiar with complex numbers. They can represent a complex number in polar form, and know how to multiply complex numbers in their polar form. (17)	4 days	

TRIGONOMETRY COURSE OUTLINE
Sorted by Text Materials (Trigonometry, 4th Edition)

Materials	Standard / Objective	Time	Assessment(s)
Solving Triangles: Trigonometric Applications Pages 125-6, 135, 145-7, 157, 167, 169-170, 179, 180-2, 192-3, 197-206, 208-211	Students are adept at using trigonometry in a variety of applications & word problems.(19)	10 days	Project: Analyzing a Graph
Trigonometry Functions: Definition of Trig Functions Page 264	Students know that the tangent of the angle a line makes with the x-axis is equal to the slope of the line. (7)	2 days	Project: Solving Equations Graphically