

## Trigonometry

Trigonometry is a five-unit elective course for high school students who have successfully completed Algebra I, Geometry, and Algebra II. The materials cover a development of trigonometry from right triangle trigonometry to oblique triangles and the polar plane. Throughout the course, students will develop trigonometric formulas and use them in real-world applications, evaluate trigonometric proofs using complex trigonometric identities and solving trigonometric equations with regard to the unit circle.

The course seeks to help students expand their knowledge and skills so that they may achieve the following goals:

- Use trigonometry as a tool for indirect measurement.
- Model natural phenomenon with trigonometric functions.
- Perform operations with complex numbers using trigonometry.
- Use trigonometric identities to evaluate trigonometric proofs and solve trigonometric equations with regard to the unit circle.
- Solve for unknown sides and angles of right and oblique triangles using right triangle trigonometry, law of sines and law of cosines.

In attaining these goals, students will begin to see the "big picture" of mathematics and understand how numeric, algebraic, and geometric concepts are woven together to build a foundation for higher mathematical thinking.

Unit 1: Right Triangle Trigonometry		
Assignments		
Trigonometry	1. Course Overview	13. Quiz 3: The Reciprocal Functions and Identities
	2. Lengths of Sides	14. Radian Measure
	3. Angle Measures	15. Reference Angles
	4. Indirect Measure	16. Velocity
	5. Quiz 1: Solving a Right Triangle	17. Quiz 4: Radian Measure
	6. Angles in the Coordinate Plane	18. Project: Parametric Equations
	7. The Unit Circle	19. Special Project*
	8. Trigonometric Values of Special Angles	20. Review
	9. Quiz 2: The Unit Circle and Special Angles	21. Test
	10. Reciprocal Functions	22. Alternate Test*
	11. Points on the Terminal Side	23. Glossary and Credits
	12. Pythagorean Identities	

Unit 2: Graphing and Inverse Functions		
Assignments		
Trigonometry	1. Graphing and Amplitude	10. Trigonometric Equations: Part II
	2. Project: The Reciprocal Functions	11. Quiz 2: Inverse Trigonometric Functions
	3. Period and Frequency	12. Project: Modeling with Periodic Functions
	4. Vertical and Horizontal Translations	13. Special Project*
	5. Sinusoidal Functions	14. Review
	6. Quiz 1: Graphing	15. Test
	7. Inverse Functions	16. Alternate Test*
	8. Inverse Reciprocal Functions	17. Glossary and Credits
	9. Trigonometric Equations: Part I	

Unit 3: Analytic Trigonometry	
Trigonometry	<b>Assignments</b>
	1. The Fundamental Trigonometric Identities
	2. Proving Identities
	3. Cosine Addition Formula
	4. Sine Addition Formula
	5. Tangent Addition Formula
	6. Quiz 1: Identities and Addition Formulas
	7. Double-Angle Formulas
	8. Project: Solving Equations Graphically
	9. Half-Angle Formulas
	10. Converting Between Products and Sums
	11. Quiz 2: More Identities
	12. Project: Adding Waves
	13. Special Project*
	14. Review
	15. Test
	16. Alternate Test*
17. Glossary and Credits	
Unit 4: Trigonometric Applications	
Trigonometry	<b>Assignments</b>
	1. Law of Sines
	2. Ambiguity and Area of a Triangle
	3. Law of Cosines: Finding a Side
	4. Law of Cosines: Finding an Angle
	5. Project: Heron's Formula
	6. Quiz 1: Trigonometry of Oblique Triangles
	7. Introduction to Vectors
	8. Vector Components
	9. Navigation Application
	10. Vector Multiplication
	11. Quiz 2: Vectors
	12. Special Project*
	13. Review
	14. Test
	15. Alternate Test*
16. Glossary and Credits	
Unit 5: Polar Coordinates	
Trigonometry	<b>Assignments</b>
	1. Introduction to Polar Coordinates
	2. Polar Equations
	3. Project: Graphing in the Polar Plane
	4. Polar Curves
	5. Polar Forms of Conics
	6. Quiz 1: Polar Equations
	7. Polar Form of Complex Numbers
	8. Multiply and Divide Complex Numbers
	9. Powers and Nth Roots
	10. Project: Fractals
	11. Quiz 2: Complex Numbers
	12. Special Project*
	13. Review
	14. Test
	15. Alternate Test*
16. Glossary and Credits	
Unit 6: Course Review and Exam	
Trigonometry	<b>Assignments</b>
	1. Review
	2. Exam
	3. Alternate Exam*