



monarch

Curriculum Catalog

Trigonometry

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Trigonometry Course Overview

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		
Assignments		
Trigonometry	1. The Fundamental Trigonometric Identities	10. Converting Between Products and Sums
	2. Proving Identities	11. Quiz 2: More Identities
	3. Cosine Addition Formula	12. Project: Adding Waves
	4. Sine Addition Formula	13. Special Project*
	5. Tangent Addition Formula	14. Review
	6. Quiz 1: Identities and Addition Formulas	15. Test
	7. Double-Angle Formulas	16. Alternate Test*
	8. Project: Solving Equations Graphically	17. Glossary and Credits
	9. Half-Angle Formulas	

Unit 4: Trigonometric Applications		
Assignments		
Trigonometry	1. Law of Sines	9. Navigation Application
	2. Ambiguity and Area of a Triangle	10. Vector Multiplication
	3. Law of Cosines: Finding a Side	11. Quiz 2: Vectors
	4. Law of Cosines: Finding an Angle	12. Special Project*
	5. Project: Heron's Formula	13. Review
	6. Quiz 1: Trigonometry of Oblique Triangles	14. Test
	7. Introduction to Vectors	15. Alternate Test*
	8. Vector Components	16. Glossary and Credits

Unit 5: Polar Coordinates		
Assignments		
Trigonometry	1. Introduction to Polar Coordinates	9. Powers and Nth Roots
	2. Polar Equations	10. Project: Fractals
	3. Project: Graphing in the Polar Plane	11. Quiz 2: Complex Numbers
	4. Polar Curves	12. Special Project*
	5. Polar Forms of Conics	13. Review
	6. Quiz 1: Polar Equations	14. Test
	7. Polar Form of Complex Numbers	15. Alternate Test*
	8. Multiply and Divide Complex Numbers	16. Glossary and Credits

Unit 6: Course Review and Exam		
Assignments		
Trig.	1. Review	3. Alternate Exam*
	2. Exam	

(*) Indicates alternative assignment