Mathematics
Course: Trigonometry
11th Grade

MATH 501 Trigonometry

> 1/2 credit
> 5 times per week (1st Semester)
> Taught in English

This is a required class for all 11th grade students in the Mexican and/or U.S. Diploma program. course will focus on the study of angles; the trigonometry of angles and real numbers; the trigonometric functions and their inverses including their graphs; solutions of right and oblique triangles; proving of fundamental identities and analytic trigonometry; addition, subtraction and multiple angle formulas, and the laws of sines and cosines. In addition, students will develop the ability   to manipulate trigonometric expressions and equations.

Textbook: Larson, Ron and Falvo, David C. Pre-Calculus. Brooks/Cole Cengage Learning: Belmont, California . 2014 (9th Edition).
Prerequisite: MATH 402

Benchmark Code – Subject: Pre-Calculus 1 = PC1 Strand

1: Fundamental Skills and Concepts Review

Strand 2: Unit Circle

Strand 3: Graphing Trigonometric Functions

Strand 4: Analytic Trigonometry

Strand 5: Additional Topics in Trigonometry

Subject.Grade.Strand#.Standard#. Benchmark#

Example: PC1.11.1.1.3 – Pre-Calculus 1, Grade 11, Strand 1, Standard 1, Benchmark 3

Strand 1: Fundamental Skills and Concepts Review

Standard 1: The student defines angles and triangles.

Benchmark Code	Benchmark
PC1.11.1.1.1	The student will define angles as measures of rotation.
PC1.11.1.1.2	The student will classify angle according to their measures and the sums of their measures, including complementary and supplementary angles.
PC1.11.1.1.3	The student will find angles in standard position.
PC1.11.1.1.4	The student will find reference angles and coterminal angles from a graph and algebraically.
PC1.11.1.1.5	The student will identify different types of triangles by sides and angles.
PC1.11.1.1.6	The student will identify the parts of a right triangle.
PC1.11.1.1.7	The student will find all six trigonometric functions (SOH CAH TOA) from right triangles.
PC1.11.1.1.8	The student will use tangent, sine, and cosine ratios to find missing sides of

	right triangles.
PC1.11.1.1.9	The student will use inverse tangent, inverse sine, and inverse cosine to find missing angles.
PC1.11.1.1.10	The student will apply the Pythagorean theorem to find missing sides of right triangles.
PC1.11.1.1.11	The student will apply the properties of special right triangles to find area and missing sides. (60°, 30°, 90°) and (45°, 45°, 90°)

Strand 2: Unit Circle

Standard 1: The student uses the unit circle to find trigonometric functions in degrees.

Benchmark Code	Benchmark
PC1.11.2.1.1	The student will define the unit circle.
PC1.11.2.1.2	The student will identify special angles in degrees on the unit circle.
PC1.11.2.1.3	The student will find all (x, y) coordinates of special angles in degrees on the unit circle.
PC1.11.2.1.4	The student will find all six trigonometric functions of special angles in degrees on the unit circle.
PC1.11.2.1.5	The student will determine the sign of all trigonometric functions by quadrants.
PC1.11.2.1.6	The student will find all six trigonometric functions of any angle using reference angles in degrees.
PC1.11.2.1.7	The student will find all six trigonometric functions of a given point on the coordinate plane.
PC1.11.2.1.8	The student will find the 5 remaining trigonometric functions given the quadrant in which the terminal side lies and the value of one trigonometric function.

Standard 2: The student uses the unit circle to find trigonometric functions in radians

Benchmark Code	Benchmark
PC1.11.2.2.1	The student will define radians as a measure of angles.
PC1.11.2.2.2	The student will convert between radian and degree measure.
PC1.11.2.2.3	The student will identify special angles in radians on the unit circle.
PC1.11.2.2.4	The student will find all (x, y) coordinates of special angles in radians on the unit circle.
PC1.11.2.2.5	The student will find all six trigonometric functions of special angles in radians on the unit circle.
PC1.11.2.2.6	The student will find all six trigonometric functions of any angle using reference angles in radians.

Standard 3 : The student uses angles in real problem applications

Benchmark Code	Benchmark
PC1.11.2.3.1	The student will find the length of an arc given the measure of the central angle.
PC1.11.2.3.2	The student will find the linear and angular velocities.

PC1.11.2.3.3	The student will find the area of a sector.

Strand 3: Graphing Trigonometric Functions

Standard 1: The student graphs the trigonometric functions.

Benchmark Code	Benchmark
PC1.11.3.1.1	The student will define the trigonometric functions as periodic functions.
PC1.11.3.1.2	The student will identify the sine and cosine graphs.
PC1.11.3.1.3	The student will graph the sine and cosine functions using transformations. (vertical and phase shift, amplitude, reflection and period).
PC1.11.3.1.4	The student will find the equation of the sine and cosine graphs.
PC1.11.3.1.5	The student will identify the tangent and cotangent graphs.
PC1.11.3.1.6	The student will graph the tangent and cotangent functions using transformations. (vertical and horizontal shifts, amplitude, reflection and period).
PC1.11.3.1.7	The student will find the equation of the tangent and cotangent graphs.
PC1.11.3.1.8	The student will identify the secant and cosecant graphs.
PC1.11.3.1.9	The student will graph the secant and cosecant functions using transformations. (vertical and horizontal shifts, amplitude, reflection and period).
PC1.11.3.1.10	The student will find the equation of the secant and cosecant graphs.

Strand 4: Analytic Trigonometry

Standard 1: The student uses the trigonometric identities and verifies them.

Benchmark Code	Benchmark
PC1.11.4.1.1	The student will identify and use reciprocal identities, quotient identities, Pythagorean identities, cofunction identities, and even/odd identities to simplify trigonometric expressions.
PC1.11.4.1.2	The student will prove trigonometric identities.
PC1.11.4.1.3	The student will use the trigonometric identities to write one function in terms of another one.
PC1.11.4.1.4	The student will use double-angle formulas, half-angle formulas, product-sum formulas to simplify trigonometric expressions.

Standard 2: The student solves trigonometric equations.

Benchmark Code	Benchmark
PC1.11.4.2.1	The student will solve trigonometric equations by factoring.
PC1.11.4.2.2	The student will solve trigonometric equations by using identities.
PC1.11.4.2.3	The student will solve equations with trigonometric functions of multiples of angles.

Strand 5: Additional Topic in Trigonometry	
Standard 1: The student solves oblique triangles using the Law of Sines and Law of Cosines.	
Benchmark Code	**Benchmark**
PC1.11.5.1.1	The student will use the Law of Sines and the Law of Cosines to solve oblique triangles.
PC1.11.5.1.2	The student will determine whether a triangle has zero, one, or two solutions.