

Trigonometry (T)

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grades 9-12
									<p>MA.912.T.1 Define and use trigonometric ratios, identities or functions to solve problems.</p> <p>MA.912.T.1.1 Define trigonometric ratios for acute angles in right triangles.</p> <p>MA.912.T.1.2 Solve mathematical and real-world problems involving right triangles using trigonometric ratios and the Pythagorean Theorem.</p> <p>MA.912.T.1.3 Apply the Law of Sines and the Law of Cosines to solve mathematical and real-world problems involving triangles.</p> <p>MA.912.T.1.4 Solve mathematical problems involving finding the area of a triangle given two sides and the included angle.</p> <p>MA.912.T.1.5 Prove Pythagorean Identities. Apply Pythagorean Identities to calculate trigonometric ratios and to solve problems.</p> <p>MA.912.T.1.6 Prove the Double-Angle, Half-Angle, Angle Sum and Difference formulas for sine, cosine, and tangent. Apply these formulas to solve problems.</p> <p>MA.912.T.1.7 Simplify expressions using trigonometric identities.</p> <p>MA.912.T.1.8 Solve mathematical and real-world problems involving one-variable trigonometric ratios.</p>
									<p>MA.912.T.2 Extend trigonometric functions to the unit circle.</p> <p>MA.912.T.2.1 Given any positive or negative angle measure in degrees or radians, identify its corresponding angle measure between 0° and 360° or between 0 and 2π. Convert between degrees and radians.</p> <p>MA.912.T.2.2 Define the six basic trigonometric functions for all real numbers by identifying corresponding angle measures and using right triangles drawn in the unit circle.</p> <p>MA.912.T.2.3 Determine the values of the six basic trigonometric functions for 0, $\pi/6$, $\pi/3$ and $\pi/4$ and their multiples using special triangles.</p> <p>MA.912.T.2.4 Use the unit circle to express the values of sine, cosine and tangent for $\pi - x$, $\pi + x$ and $2\pi - x$ in terms of their values for x, where x is any real number.</p> <p>MA.912.T.2.5 Given angles measured in radians or degrees, calculate the values of the six basic trigonometric functions using the unit circle, trigonometric identities or technology.</p>

MA.912.T.3
Graph and apply trigonometric relations and functions.

MA.912.T.3.1
Given a mathematical or real-world context, choose sine, cosine or tangent trigonometric functions to model periodic phenomena with specified amplitude, frequency, horizontal shift and midline.

MA.912.T.3.2
Given a table, equation or written description of a trigonometric function, graph that function and determine key features.

MA.912.T.3.3
Solve and graph mathematical and real-world problems that are modeled with trigonometric functions. Interpret key features and determine constraints in terms of the context.

MA.912.T.4
Extend rectangular coordinates and equations to polar and parametric forms.

MA.912.T.4.1
Define and plot polar coordinates. Convert between polar coordinates and rectangular coordinates with and without the use of technology.

MA.912.T.4.2
Represent equations given in rectangular coordinates in terms of polar coordinates. Represent equations given in polar coordinates in terms of rectangular coordinates.

MA.912.T.4.3
Graph equations in the polar coordinate plane with and without the use of graphing technology.

MA.912.T.4.4
Identify and graph special polar equations, including circles, cardioids, limacons, rose curves and lemniscates.

MA.912.T.4.5
Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion.

MA.912.T.4.6
Convert from a parametric representation of a plane curve to a rectangular equation, and convert from a rectangular equation to a parametric representation of a plane curve.

MA.912.T.4.7
Apply parametric equations to model applications of motion in the plane.